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LED LCD TV

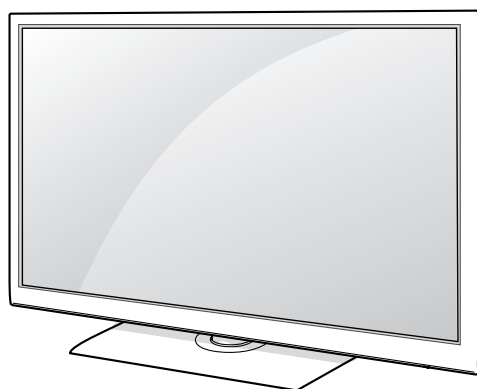
SERVICE MANUAL

CHASSIS : LB12E

MODEL : 32LV5500 32LV5500-TA

CAUTION

BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL67007009 (1103-REV00)

Printed in Korea

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by \triangle in the Schematic Diagram and Exploded View.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer** should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10 mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 M Ω and 5.2 M Ω .

When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.

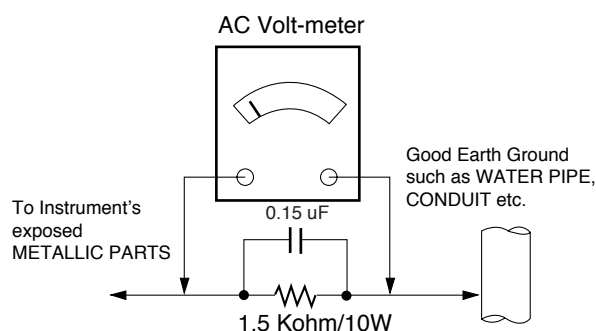
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 μ F capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5 mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω

*Base on Adjustment standard

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied to the LCD TV used LB12E chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

- 1) Temperature: 25 °C ± 5 °C(77 °F ± 9 °F), CST: 40 °C ± 5 °C
- 2) Relative Humidity : 65 % ± 10 %
- 3) Power Voltage
 - : Standard input voltage (AC 100-240 V~, 50 / 60 Hz)
 - * Standard Voltage of each products is marked by models.
- 4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
- 5) The receiver must be operated for about 5 minutes prior to the adjustment.

3. Test method

- 1) Performance: LGE TV test method followed
- 2) Demanded other specification
 - Safety : CE, IEC specification
 - EMC :CE, IEC

4. Model General Specification

No.	Item	Specification	Remarks
1.	Market	ASIA, Oceania, Africa, Middle East(PAL/DVB Market)	DTV & Analog * DTV Region : Australia/New Zealand(AU), Singapore(SG), Indonesia(ID), Malaysia(MY), Vietnam(VN), South Africa(ZA), Iran(IR)
2.	Broadcasting system	1) PAL-B/G 2) PAL-D/K 3) PAL-I/I' 3) SECAM-DK, BG, I 4) DVB-T	* Australia/India : only PAL
3.	Receiving system	Analog : Upper Heterodyne Digital : COFDM, QAM	► DVB-T - Guard Interval(Bitrate_Mbit/s) 1/4, 1/8, 1/16, 1/32 - Modulation : Code Rate QPSK : 1/2, 2/3, 3/4, 5/6, 7/8 16-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 64-QAM : 1/2, 2/3, 3/4, 5/6, 7/8
4.	Video Input RCA (2EA)	PAL, SECAM, NTSC	4 System : PAL, SECAM, NTSC, PAL60 Rear 1EA, AV gender jack 1EA
5.	Head phone out	Antena, AV1, AV3, Component1, Component2,RGB, HDMI1, HDMI2, HDMI3, HDMI4, USB1, USB2	
6.	Component Input (2EA)	Y/Cb/Cr, Y/Pb/Pr	Rear 1EA, Gender 1EA
7.	RGB Input (1EA)	RGB-PC	Analog(D-SUB 15PIN)
8.	HDMI Input (4EA)	HDMI1-ARC HDMI2 HDMI3 HDMI4	PC(HDMI version 1.3) Support HDCP
9.	Audio Input (5EA)	RGB/DVI Audio Component1,2 AV1,2	L/R Input
10.	SDPIF out (1EA)	SPDIF out	
11.	USB (2EA)	EMF, DivX HD, For SVC(download)	JPEG, MP3, DivX HD Plus

5. Component Video Input (Y, C_B/P_B, C_R/P_R)

No.	Specification				Remark
	Resolution	H-freq(kHz)	V-freq(Hz)		
1.	720x480	15.73	60.00	SDTV,DVD 480i	
2.	720x480	15.63	59.94	SDTV,DVD 480i	
3.	720x480	31.47	59.94	480p	
4.	720x480	31.50	60.00	480p	
5.	720x576	15.625	50.00	SDTV,DVD 625 Line	
6.	720x576	31.25	50.00	HDTV 576p	
7.	1280x720	45.00	50.00	HDTV 720p	
8.	1280x720	44.96	59.94	HDTV 720p	
9.	1280x720	45.00	60.00	HDTV 720p	
10.	1920x1080	31.25	50.00	HDTV 1080i	
11.	1920x1080	33.75	60.00	HDTV 1080i	
12.	1920x1080	33.72	59.94	HDTV 1080i	
13.	1920x1080	56.250	50	HDTV 1080p	
14.	1920x1080	67.5	60	HDTV 1080p	

6. RGB (PC)

No.	Specification				Proposed	Remarks
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel Clock(MHz)		
1.	720*400	31.468	70.08	28.321		For only DOS mode
2.	640*480	31.469	59.94	25.17	VESA	Input 848*480 60 Hz, 852*480 60 Hz -> 640*480 60 Hz Display
3.	800*600	37.879	60.31	40.00	VESA	
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	
5.	1360*768	47.72	59.8	84.75	WXGA	
6.	1920*1080	66.587	59.93	138.625	WUXGA	FHD model

7. HDMI Input

(1) DTV Mode

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*480	31.469 /31.5	59.94 /60	27.00/27.03	SDTV 480P	
2.	720*576	31.25	50	54	SDTV 576P	
3.	1280*720	37.500	50	74.25	HDTV 720P	
4.	1280*720	44.96 /45	59.94 /60	74.17/74.25	HDTV 720P	
5.	1920*1080	33.72 /33.75	59.94 /60	74.17/74.25	HDTV 1080I	
6.	1920*1080	28.125	50.00	74.25	HDTV 1080I	
7.	1920*1080	26.97 /27	23.97 /24	74.17/74.25	HDTV 1080P	
8.	1920*1080	33.716 /33.75	29.976 /30.00	74.25	HDTV 1080P	
9.	1920*1080	56.250	50	148.5	HDTV 1080P	
10.	1920*1080	67.43 /67.5	59.94 /60	148.35/148.50	HDTV 1080P	

(2) PC Mode

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*400	31.468	70.08	28.321		HDCP
2.	640*480	31.469	59.94	25.17	VESA	HDCP
3.	800*600	37.879	60.31	40.00	VESA	HDCP
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	HDCP
5.	1360*768	47.72	59.8	84.75	WXGA	HDCP
6.	1920*1080	67.5	60.00	138.625	WUXGA	HDCP/FHD model

9. 3D Mode - HDMI & USB

(1) HDMI Input (V1.4a)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	1920*1080	53.95 / 54	23.98 / 24	148.35/148.5	HDTV 1080P	Frame packing
2	1280*720	89.9 / 90	59.94/60	148.35/148.5	HDTV 720P	Frame packing
3	1280*720	75	50	148.5	HDTV 720P	Frame packing
4	1920*1080	67.5	60	148.5	HDTV 1080P	Side by Side(half), Top and bottom
5	1920*1080	56.3	50	148.5	HDTV 1080P	Side by Side(half), Top and bottom
6	1280*720	45	60	74.25	HDTV 720P	Side by Side(half), Top and Bottom
7	1280*720	37.5	50	74.25	HDTV 720P	Side by Side(half), Top and Bottom
8	1920*1080	33.7	60	74.25	HDTV 1080i	Side by Side(half), Top and Bottom
9	1920*1080	28.1	50	74.25	HDTV 1080i	Side by Side(half), Top and Bottom
10	1920*1080	27	24	74.25	HDTV 1080P	Side by Side(half), Top and Bottom
11	1920*1080	33.7	30	89.1	HDTV 1080P	Side by Side(half), Top and Bottom

(2) HDMI Input(1.3)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	1280*720	45.00	60.00	74.25	HDTV 720P	Side by Side, Top & Bottom
2	1280*720	37.500	50	74.25	HDTV 720P	Side by Side, Top & Bottom
3	1920*1080	33.75	60.00	74.25	HDTV 1080I	Side by Side, Top & Bottom
4	1920*1080	28.125	50.00	74.25	HDTV 1080I	Side by Side, Top & Bottom
5	1920*1080	27.00	24.00	74.25	HDTV 1080P	Side by Side, Top & Bottom, Checkerboard
6	1920*1080	33.75	30.00	74.25	HDTV 1080P	Side by Side, Top & Bottom, Checkerboard
7	1920*1080	67.50	60.00	148.5	HDTV 1080P	Side by Side, Top & Bottom, Checkerboard Single Frame Sequential
8	1920*1080	56.250	50	148.5	HDTV 1080P	Side by Side, Top & Bottom, Checkerboard Single Frame Sequential

(3) RF 3D Input(DTV)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	1280*720	37.500	50	74.25	HDTV 720P	Side by Side, Top & Bottom
2	1920*1080	28.125	50	74.25	HDTV 1080I	Side by Side, Top & Bottom

(4) RGB-PC Input

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	1920*1080	67.5	60	148.5	HDTV 1080P	Side by Side, Top & Bottom

(5) DLNA

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	1920*1080	33.75	30	74.25	HDTV 1080P	Side by Side, Top & Bottom, Checkerboard


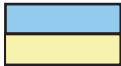
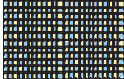
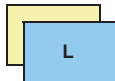
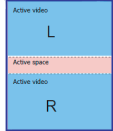
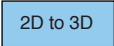
(6) USB Input

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode	Proposed
1	1920*1080	33.75	30.000	74.25	Side by Side Top & Bottom Checkerboard	HDTV 1080P

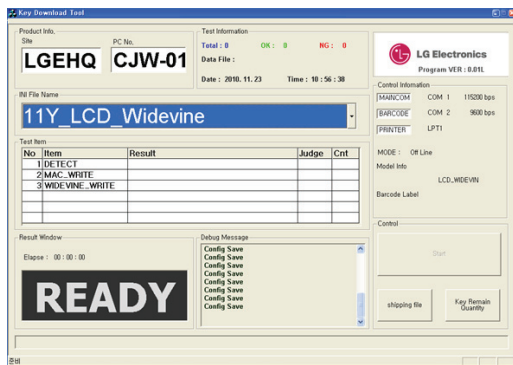
(7) DVR

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode	Proposed
1	ALL	-	-	-	Side by Side Top & Bottom	

(8) 3D Input mode

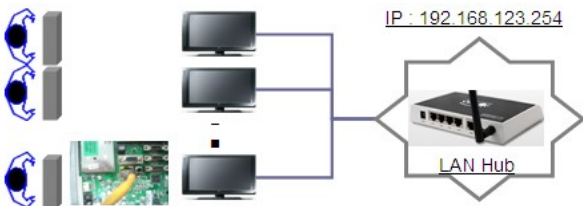
No.	Side by Side	Top & Bottom	Checkerboard	Single Frame Sequential	Frame Packing	2D to 3D
1						

- 2) MAC Address Download, Whidevine Download
- Com 1,2,3,4 and 115200(Baud rate)

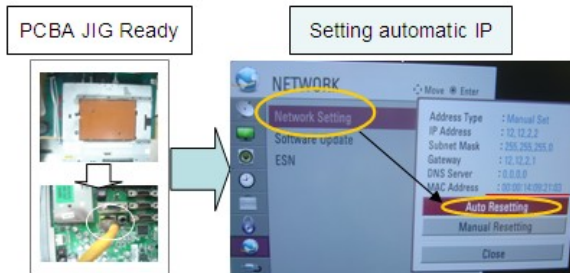


3.3. LAN

- (1) Equipment & Condition
 - Each other connection to LAN Port of IP Hub and Jig
- (2) LAN inspection solution
 - LAN Port connection with PCB
 - Network setting at MENU Mode of TV
 - setting automatic IP
 - Setting state confirmation



-> If automatic setting is finished, you confirm IP and MAC Address.



- (3) WIDEVINE key Inspection
- Confirm key input data at the "IN START" MENU Mode.



3.4. LAN PORT INSPECTION(PING TEST)

Connect SET -> LAN port == PC -> LAN Port



- (1) Equipment setting
 - 1) Play the LAN Port Test PROGRAM.
 - 2) Input IP set up for an inspection to Test Program.
*IP Number : 12.12.2.2
- (2) LAN PORT inspection (PING TEST)
 - 1) Play the LAN Port Test Program.
 - 2) Connect each other LAN Port Jack.
 - 3) Play Test (F9) button and confirm OK Message.
 - 4) Remove LAN CABLE



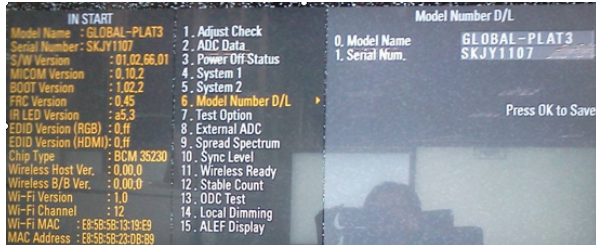
3.5. Model name & Serial number Download

- (1) Model name & Serial number D/L
 - Press "Power on" key of service remote control.(Baud rate : 115200 bps)
 - Connect RS232 Signal Cable to RS-232 Jack.
 - Write Serial number by use RS-232.
 - Must check the serial number at Instart menu.
- (2) Method & notice
 - A. Serial number D/L is using of scan equipment.
 - B. Setting of scan equipment operated by Manufacturing Technology Group.
 - C. Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0

* Manual Download (Model Name and Serial Number)
If the TV set is downloaded by OTA or service man, sometimes model name or serial number is initialized.(Not always)

It is impossible to download by bar code scan, so It need Manual download.

- Press the 'Instart' key of ADJ remote control.
- Go to the menu '5.Model Number D/L' like below photo.
- Input the Factory model name(ex 42LD450-TA) or Serial number like photo.



- Check the model name Instart menu -> Factory name displayed (ex 42LE7500-TA)
- Check the Diagnostics(DTV country only) -> Buyer model displayed (ex 42LE7500-TA)

3.6. WIFI MAC ADDRESS CHECK

- Using RS232

	H-freq(kHz)	V-freq.(Hz)
Transmission	[A][I][][Set ID][][20][Cr]	[O][K][X] or [NG]

- Check the menu on in-start



4. Manual Adjustment

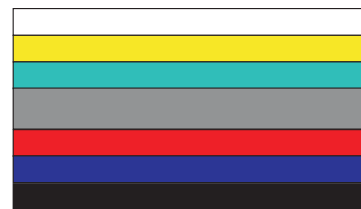
4.1. ADC Adjustment

4.1.1. Overview

ADC adjustment is needed to find the optimum black level and gain in Analog-to-Digital device and to compensate RGB deviation.

4.1.2. Equipment & Condition

- Adjust Remote control
- 801GF(802B, 802F, 802R) or MSPG925FA Pattern Generator
 - Resolution :
 - 480i, 720*480(MSPG-925FA -> Model: 209, Pattern: 65) - 480i
 - 1080p, 1920*1080(MSPG-925FA -> Model: 225, Pattern: 65) - 1080p
 - Pattern : Horizontal 100 % Color Bar Pattern
 - Pattern level: 0.7 ± 0.1 Vp-p
 - Image



- Must use standard cable

4.1.3. Adjust method

- ADC 480i, 1080p Comp1
 - Check connected condition of Comp1 cable to the equipment.
 - Give a 480i, 1080p Mode, Horizontal 100% Color Bar Pattern to Comp1.
 - (MSPG-925FA -> Model: 209, Pattern: 65) - 480i
 - (MSPG-925FA -> Model: 225, Pattern: 65) - 1080p
 - Change input mode as Component1 and picture mode as "Standard"
 - Press the In-start Key on the ADJ remote after at least 1 min of signal reception. Then, select 7. External ADC -> 1. COMP 1080p on the menu. Press enter key. The adjustment will start automatically.
 - If ADC calibration is successful, "ADC RGB Success" is displayed. If ADC calibration is failure, "ADC RGB Fail" is displayed.
 - If ADC calibration is failure, after recheck ADC pattern or condition retry calibration Error message refer to 5).
- ADC 1920*1080 RGB
 - Check connected condition of Component & RGB cable to the equipment
 - Give a 1920*1080 Mode, 100 % Horizontal Color Bar Pattern to RGB port.
 - (MSPG-925 Series -> model: 225 , pattern: 65)
 - Change input mode as RGB and picture mode as "Standard".
 - Press the In-start Key on the ADJ remote after at least 1 min of signal reception. Then, select 7. External ADC -> 1. COMP 1080p on the menu. Press enter key. The adjustment will start automatically.
 - If ADC calibration is successful, "ADC RGB Success" is displayed. If ADC calibration is failure, "ADC RGB Fail" is displayed.
 - If ADC calibration is failure, after recheck ADC pattern or condition retry calibration Error message refer to 5).

4.2. EDID(The Extended Display Identification Data)/DDC(Display Data Channel) download

(1) Overview




It is a VESA regulation. A PC or a MNT will display an optimal resolution through information sharing without any necessity of user input. It is a realization of "Plug and Play".

(2) Equipment

- Adjust remote control
- Since embedded EDID data is used, EDID download JIG, HDMI cable and D-sub cable are not need.

(3)Download method

- 1) Press Adj. key on the Adj. R/C, then select "10.EDID D/L", By pressing Enter key, enter EDID D/L menu.
- 2) Select [Start] button by pressing Enter key, HDMI1/ HDMI2/ HDMI3/ HDMI4/ RGB are Writing and display OK or NG

For Analog EDID	For HDMI EDID	
D-sub to D-sub	DVI-D to HDMI or HDMI to HDMI	
		

(4) EDID DATA

■ RGB

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	15	01	03	68	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	71	40	81	C0	81	00	81	80	95	00
30	90	40	A9	C0	B3	00	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	66	21	50	B0	51	00	1B	30
50	40	70	36	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	00	98

■ HDMI

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	14	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	71	4F	81	01	01	01	01	01	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	D7
80	02	03	26	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
90	22	15	01	26	15	07	50	09	57	07	67	03	0C	00	XX	XX
A0	B8	2D	E3	05	03	01	01	1D	80	18	71	1C	16	20	58	2C
B0	25	00	A0	5A	00	00	00	9E	01	1D	00	80	51	D0	1A	20
C0	6E	88	55	00	A0	5A	00	00	00	1A	02	3A	80	18	71	38
D0	2D	40	58	2C	45	00	A0	5A	00	00	00	1E	66	21	50	B0
E0	51	00	1B	30	40	70	36	00	A0	5A	00	00	00	1E	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	XX

* Physical Add & Checksum(HDMI1/2/3/4)

INPUT	9Eh/9Fh(Physical Add)		FFh(Checksum)
HDMI 1	10	00	D9
HDMI 2	20	00	C9
HDMI 3	30	00	B9
HDMI 4	40	00	A9

4.3. White Balance Adjustment

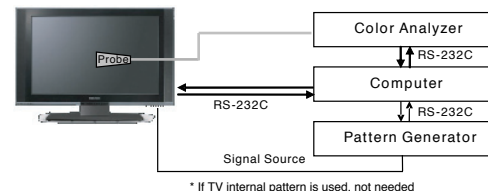
4.3.1. Overview

- (1) W/B adj. Objective & How-it-works
- (2) Objective: To reduce each Panel's W/B deviation
- (3) How-it-works : When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.
- (4) Adj. condition : normal temperature
 - 1) Surrounding Temperature : 25 °C ± 5 °C
 - 2) Warm-up time: About 5 Min
 - 3) Surrounding Humidity : 20 % ~ 80 %

4.3.2. Equipment

- 1) Color Analyzer: CA-210 (LED Module : CH 14)
 - 2) Adj. Computer(During auto adj., RS-232C protocol is needed)
 - 3) Adjust Remote control
 - 4) Video Signal Generator MSPG-925F 720p/216-Gray (Model:217, Pattern:78)
 - > Only when internal pattern is not available
- Color Analyzer Matrix should be calibrated using CS-1000

4.3.3. Equipment connection MAP



4.3.4. Adj. Command (Protocol)

<Command Format>

[START] [6E] [A] [50] [A] [LEN] [A] [03] [A] [CMD] [A] [00] [A] [VAL] [A] [CS] [A] [STOP]

- LEN: Number of Data Byte to be sent
 - CMD: Command
 - VAL: FOS Data value
 - CS: Checksum of sent data
 - A: Acknowledge
- Ex) [Send: JA_00_DD] / [Ack: A_00_okDDX]

■ RS-232C Command used during auto-adj.

RS-232C COMMAND [CMD ID DATA]			Explanation
wb	00	00	Begin White Balance adj.
wb	00	10	Gain adj.(internal white pattern)
wb	00	1f	Gain adj. completed
wb	00	20	Offset adj.(internal white pattern)
wb	00	2f	Offset adj. completed
wb	00	ff	End White Balance adj.(Internal pattern disappears)

Ex) wb 00 00 -> Begin white balance auto-adj.
wb 00 10 -> Gain adj.
ja 00 ff -> Adj. data
jb 00 c0
...
...
wb 00 1f -> Gain adj. completed
*(wb 00 20(Start), wb 00 2f(completed)) -> Off-set adj.
wb 00 ff -> End white balance auto-adj.

■ Adj. Map

	ITEM	Command		Data Range(Hex.)		Default(Decimal)
		Cmd 1	Cmd 2	Min	Max	
Cool	R-Gain	j	g	00	C0	
	G-Gain	j	h	00	C0	
	B-Gain	j	i	00	C0	
	R-Cut					
	G-Cut					
	B-Cut					
Medium	R-Gain	j	a	00	C0	
	G-Gain	j	b	00	C0	
	B-Gain	j	c	00	C0	
	R-Cut					
	G-Cut					
	B-Cut					
Warm	R-Gain	j	d	00	C0	
	G-Gain	j	e	00	C0	
	B-Gain	j	f	00	C0	
	R-Cut					
	G-Cut					

4.3.5. Adj. method

(1) Auto adj. method

- 1) Set TV in adj. mode using POWER ON key.
- 2) Zero calibrate probe then place it on the center of the Display.
- 3) Connect Cable (RS-232C)
- 4) Select mode in adj. Program and begin adjustment.
- 5) When adj. is complete (OK Sign), check adj. status pre mode. (Warm, Medium, Cool)
- 6) Remove probe and RS-232C cable to complete adj.

■ W/B Adj. must begin as start command "wb 00 00", and finish as end command "wb 00 ff", and Adj. offset if need.

(2) Manual adj. method

- 1) Set TV in Adj. mode using POWER ON.
- 2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10 cm of the surface.
- 3) Press ADJ key -> EZ adjust using adj. R/C -> 7. White-Balance then press the cursor to the right (KEY ►).
(When KEY(►) is pressed 216 Gray internal pattern will be displayed)
- 4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
- 5) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

■ If internal pattern is not available, use RF input. In EZ Adj. menu 7.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner(ON). By selecting OFF, you can adjust using RF signal in 216 Gray pattern.

■ Adj. condition and cautionary items

- 1) Lighting condition in surrounding area
Surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
- 2) Probe location
: Color Analyzer (CA-210) probe should be within 10 cm and perpendicular of the module surface (80° ~ 100°)
- 3) Aging time
- After Aging Start, Keep the Power ON status during 5 Minutes.
- In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

4.3.6. Reference (White Balance Adj. coordinate and color temperature)

■ Luminance : 204 Gray

■ Standard color coordinate and temperature using CS-1000 (over 26 inch)

Mode	Color Coordination		Temp	ΔUV
	x	y		
COOL	0.269 ± 0.002	0.273 ± 0.002	13000 K	0.0000
MEDIUM	0.285 ± 0.002	0.293 ± 0.002	9300 K	0.0000
WARM	0.313 ± 0.002	0.329 ± 0.002	6500 K	0.0000

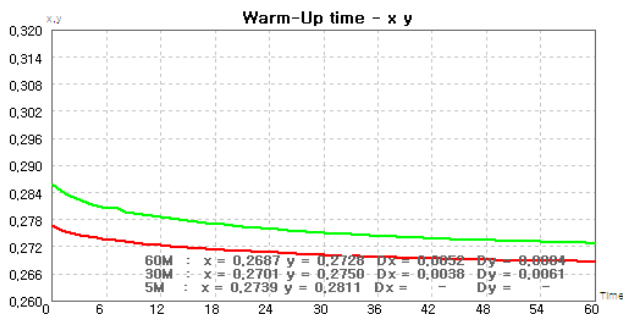
■ Standard color coordinate and temperature using CA-210 (CH 9)

Mode	Color Coordination		Temp	ΔUV
	x	y		
COOL	0.269	0.273	13000 K	0.0000
MEDIUM	0.285	0.293	9300 K	0.0000
WARM	0.313	0.329	6500 K	0.0000

4.3.7. ALELF & EDGE LED White balance table

- ALELF&EDGE LED module change color coordinate because of aging time.
- Apply under the color coordinate table, for compensated aging time.
- EDGE LED - LGD Only

GP3	Aging Time (Min.)	Cool		Medium		Warm	
		X	Y	X	Y	X	Y
		269	273	285	293	313	329
1	0-2	279	288	295	308	319	338
2	3-5	278	286	294	306	318	336
3	6-9	277	285	293	305	317	335
4	10-19	276	283	292	303	316	333
5	20-35	274	280	290	300	314	330
6	36-49	272	277	288	297	312	327
7	50-79	271	275	287	295	311	325
8	80-149	270	274	286	294	310	324
9	Over 150	269	273	285	293	309	323



4.4. Wireless function check

- Step 1) Connect set and Dongle of Wireless to Cable of HDMI & TTA 20Pin
- Step 2) At OSD of SET, check the message like Fig 3.
- Step 3) Detach Cable of Wireless Dongle



Fig.1

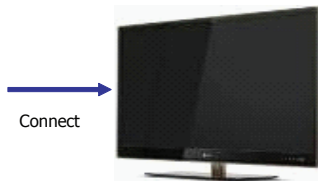


Fig.2

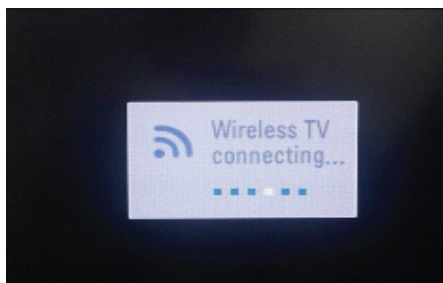


Fig.3 Connect the Dongle

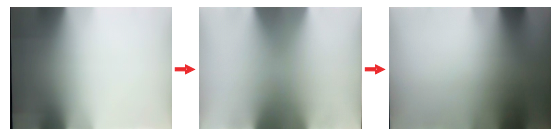
4.5. EYE-Q function check

- Step 1) Turn on TV.
- Step 2) Press EYE key of Adj. R/C.
- Step 3) Cover the Eye Q II sensor on the front of the using your hand and wait for 6 seconds.
- Step 4) Confirm that R/G/B value is lower than 10 of the "Raw Data (Sensor data, Back light)". If after 6 seconds, R/G/B value is not lower than 10, replace Eye Q II sensor.
- Step 5) Remove your hand from the Eye Q II sensor and wait for 6 seconds.
- Step 6) Confirm that "ok" pop up. If change is not seen, replace Eye Q II sensor.

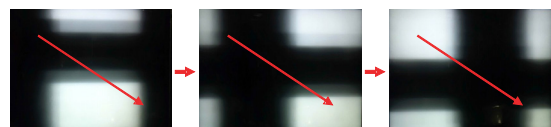


4.6. Local Dimming Function Check

- Step 1) Turn on TV.
- Step 2) At the Local Dimming mode, module Edge Backlight moving right to left Back light of IOP module moving.
- Step 3) Confirm the Local Dimming mode.
- Step 4) Press "exit" key.



Local Dimming Demo (Edge LED Model)



Local Dimming Demo (IOP & ALEF Model)

4.7. Magic Motion Remote control test

- Equipment : RF Remote control for test, IR-KEY-Code Remote control for test
- You must confirm the battery power of RF-Remote control before test(recommend that change the battery per every lot)
- Sequence (test)
 - 1) if you select the 'start(Mute)' key on the controller, you can pairing with the TV SET.
 - 2) You can check the cursor on the TV Screen, when select the 'OK' key on the controller
 - 3) You must remove the pairing with the TV Set by select 'OK' Key + 'Mute' key on the controller for 5 seconds.

4.8. Option selection per country

(1) Overview

- Option selection is only done for models in Non-EU.
- Applied model: LB12C/D/E Chassis applied Non-EU model.

(2) Method

- 1) Press ADJ key on the Adj. R/C, then select Country Group Meun.
- 2) Depending on destination, select Country Group Code 12 or Country Group A-ASIA.
- 3) Press ADJ key on the Adj. R/C, then select Area Option.
- 4) Depending on Area code number, select Default Lang., Wi-Fi Frequency, Lang Gr., Teletext Lang Gr., I II Save, HDEV, MONO, Location.

4.9. Tool Option selection

- Method : Press Adj. key on the Adj. Remote Control, then select Tool option.

Module	Tool 1	Tool 2	Tool 3	Tool 4	Tool 5	Tool 6	Remark
LGD	32996	715	3327	17594	8789	663	STD B/L: 60
CMI	35044	715	3327	17594	8917	665	

4.10. Ship-out mode check(In-stop)

After final inspection, press IN-STOP key of the Adjustment remote control and check that the unit goes to Stand-by mode.

4.11. GND and Internal Pressure check

(1) Method

- 1) GND & Internal Pressure auto-check preparation
 - Check that Power Cord is fully inserted to the SET.
(If loose, re-insert)
- 2) Perform GND & Internal Pressure auto-check
 - Unit fully inserted Power cord, Antenna cable and A/V arrive to the auto-check process.
 - Connect D-terminal to AV JACK TESTER
 - Auto CONTROLLER(GWS103-4) ON
 - Perform GND TEST
 - If NG, Buzzer will sound to inform the operator.
 - If OK, changeover to I/P check automatically.
(Remove CORD, A/V form AV JACK BOX)
 - Perform I/P test
 - If NG, Buzzer will sound to inform the operator.
 - If OK, Good lamp will lit up and the stopper will allow the pallet to move on to next process.

(2) Checkpoint

- TEST voltage
 - GND: 1.5 KV / min at 100 mA
 - SIGNAL: 3 KV / min at 100 mA
- TEST time: 1 second
- TEST POINT
 - GND TEST = POWER CORD GND & SIGNAL CABLE METAL GND
 - Internal Pressure TEST = POWER CORD GND & LIVE & NEUTRAL
- LEAKAGE CURRENT: At 0.5 mArms

5. Audio

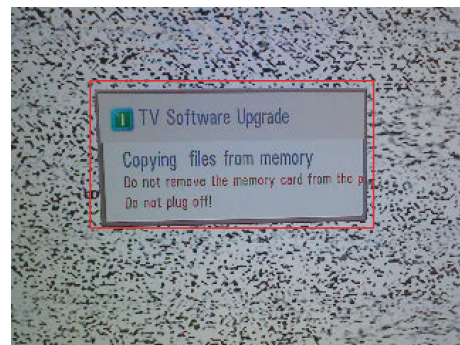
No.	Item	Min.	Typ.	Max.	Unit	
1.	Audio practical max Output, L/R (Distortion=10 % max Output)	9.0	10.0	12.0	W	EQ Off AVL Off
		8.5	8.9	9.8	Vrms	Clear Voice Off
2.	Speaker (8 Ω Impedance)		10.0	15.0	W	EQ On AVL On Clear Voice On

Measurement condition:

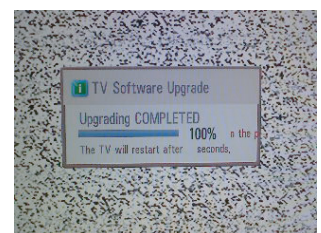
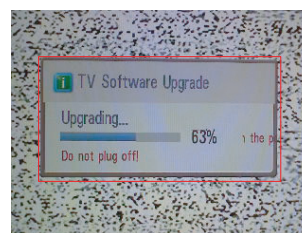
1. RF input: Mono, 1 KHz sine wave signal, 100 % Modulation
2. CVBS, Component: 1 KHz sine wave signal 0.5 Vrms
3. RGB PC: 1 KHz sine wave signal 0.7 Vrms

6. USB S/W download(Service only)

- 1) Put the USB Stick to the USB socket
- 2) Automatically detecting update file in USB Stick
 - If your downloaded program version in USB Stick is Low, it didn't work. But your downloaded version is High, USB data is automatically detecting
- 3) Show the message "Copying files from memory"



- 4) Updating is starting.



- 5) Updating Completed, The TV will restart automatically
- 6) If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)
 - * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.

* After downloading, have to adjust TOOL OPTION again.

- 1) Push "IN-START" key in service remote control.
- 2) Select "Tool Option 1" and Push "OK" button.
- 3) Push in the number. (Each model has their number.)

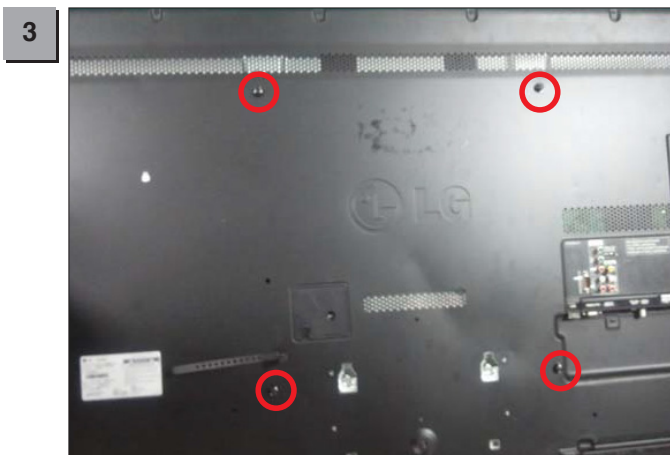
DISASSEMBLY



Loosen 4 screws that bind Stand Assembly and set.



Disassemble 18 screws around the 4 edges of set after separation Stand Assembly.



Disassemble 4 VESA screws.



Disassemble 3 screws that fix Side AV bracket and Back cover.



Disassemble 1 screw which bind Main Board and Back cover.



Detach Power cord Cover from the Back cover.

7



Push the latch to get Power cord out of the set.
Remove the Back cover.

8



Disconnect cables of Soft touch PCB, Motion PCB, Speaker from Main board.

9

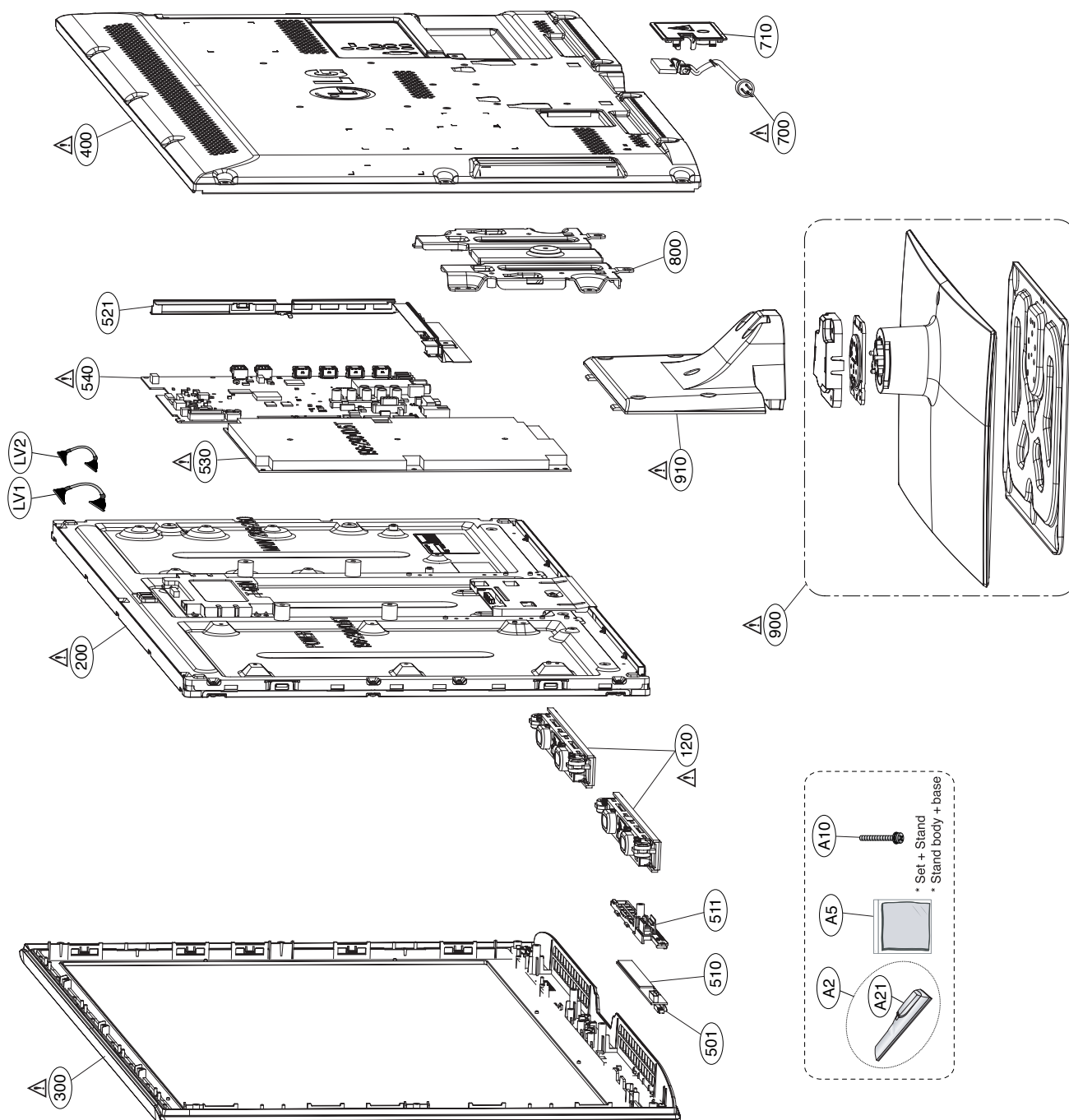


Push the Panel aside and bend Cabinet back. Take the Panel out of Cabinet by detaching latch.

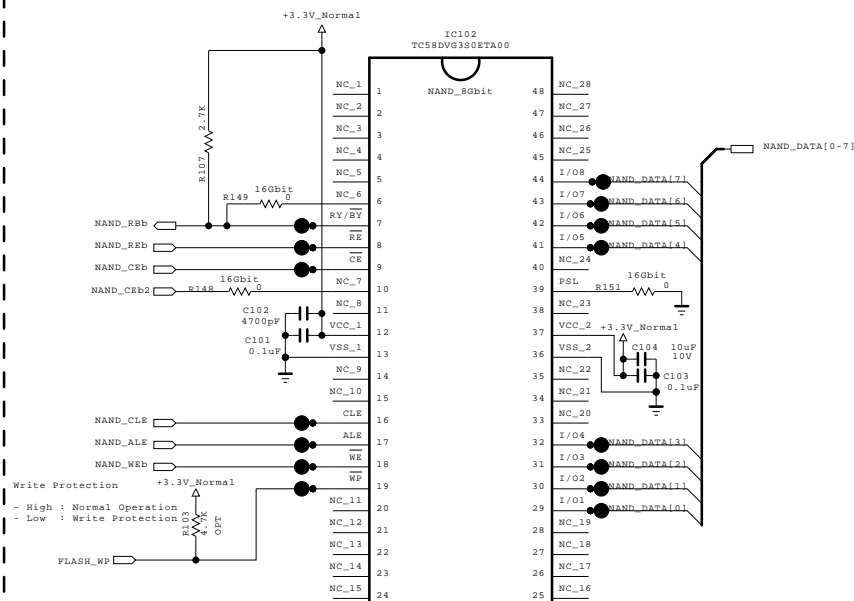
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

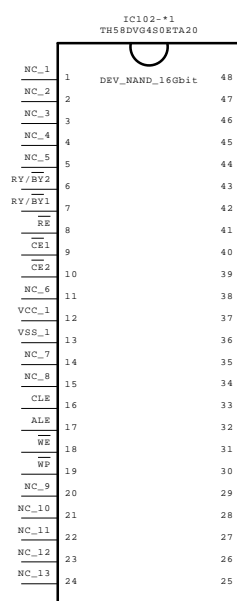
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by Δ in the Schematic Diagram and EXPLODED VIEW. It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards. Do not modify the original design without permission of manufacturer.



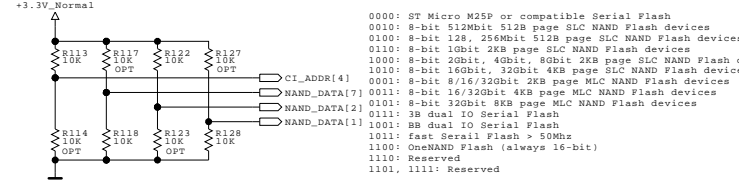
NAND FLASH MEMORY 8Gbit



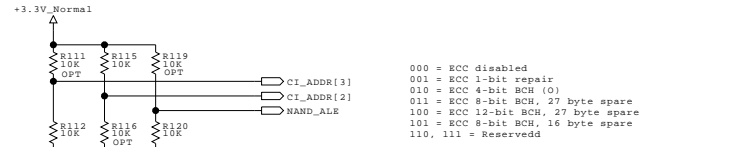
16Gbit



Boot ROM Device Select - (FA4,FAD7,FAD2,FAD1)

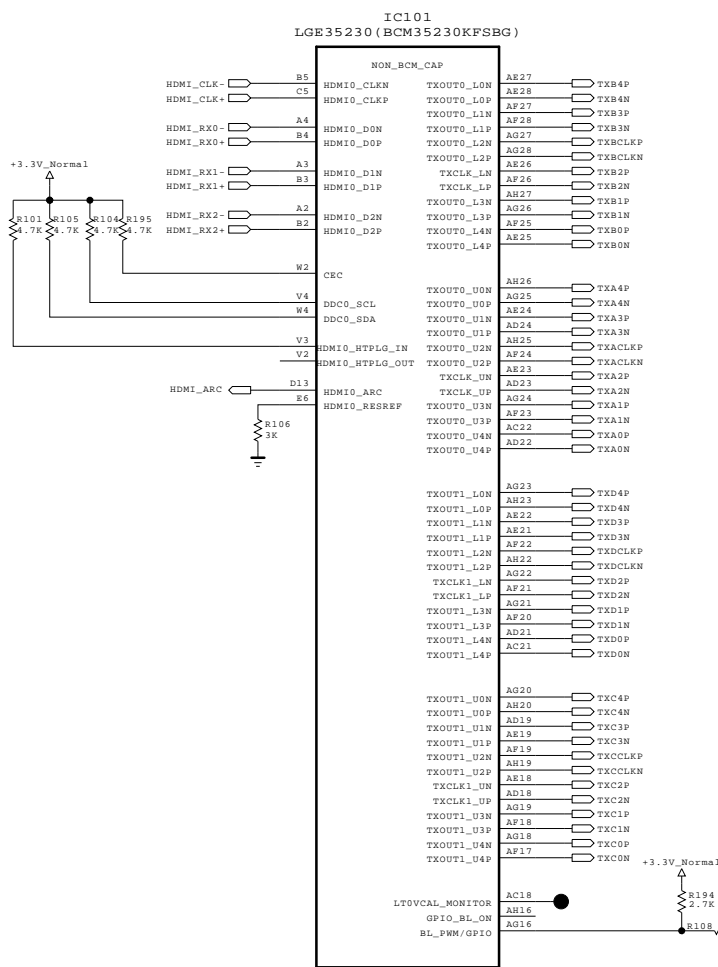
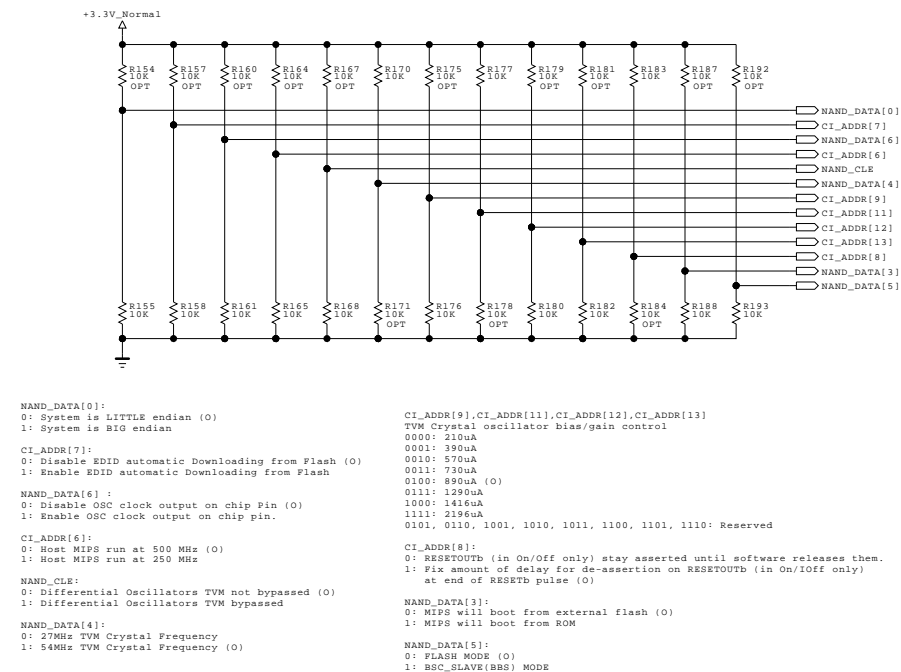


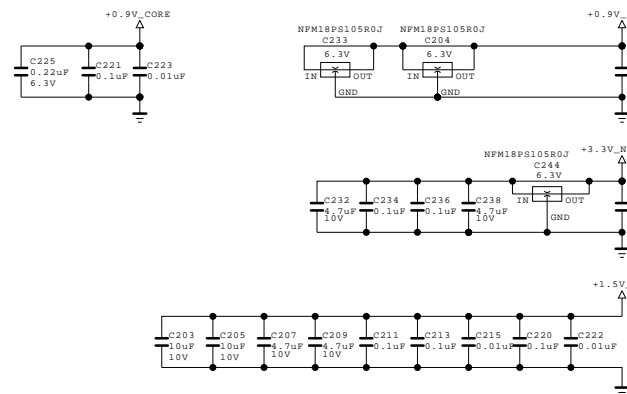
NAND ECC (FA3, FA2, FALE)



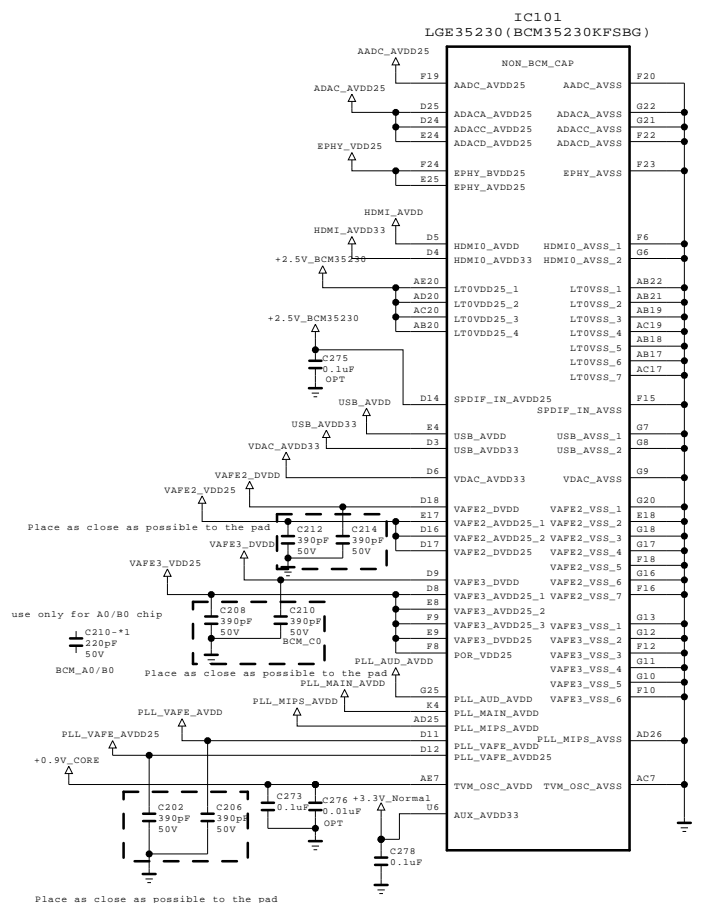
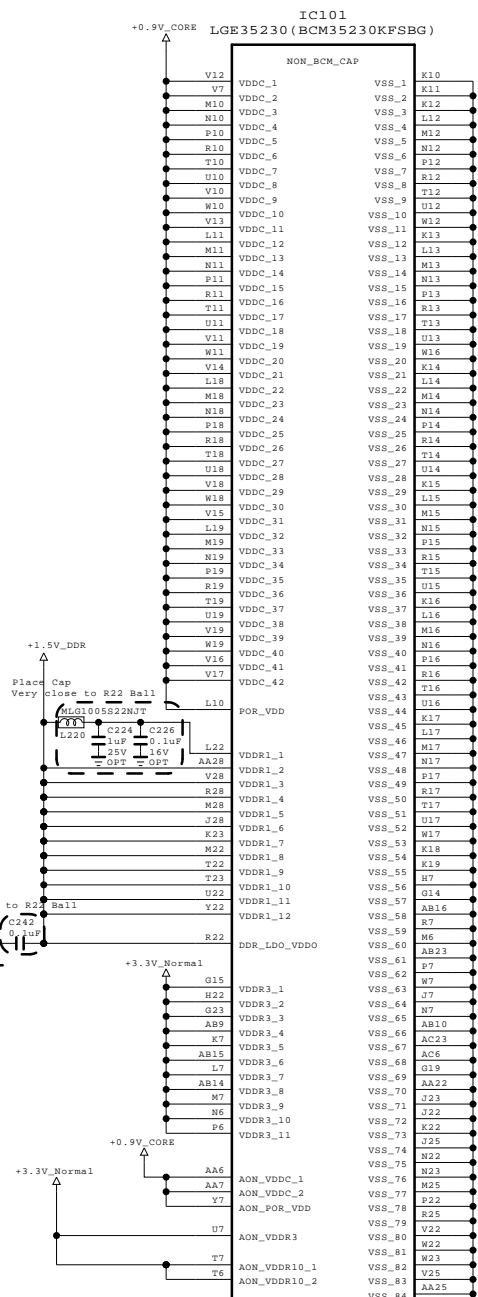
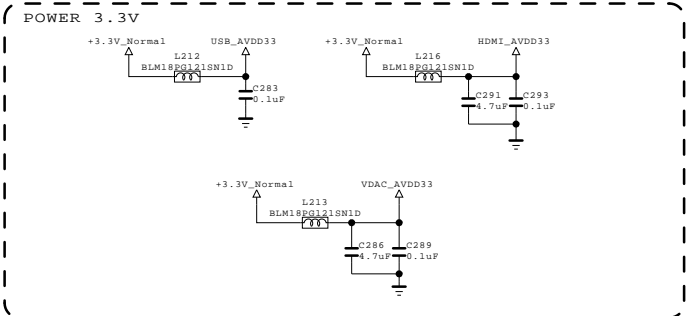
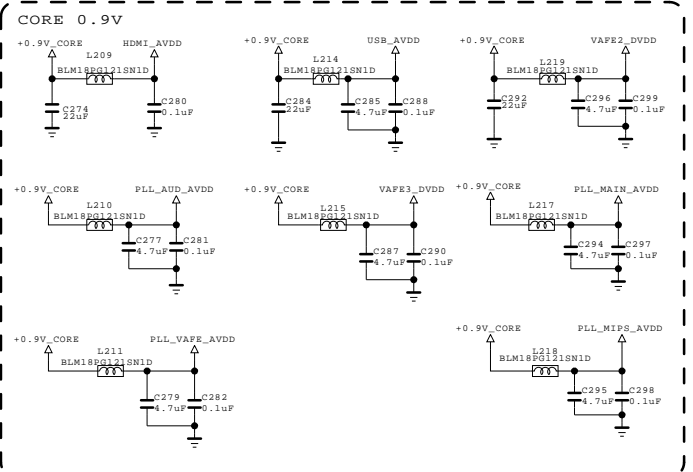
DUAL COMPONENT		
IC102	1ST : EAN61000101	2ND : T-TH58DVG4S0ETA20
IC102-*1		

Strap Setting





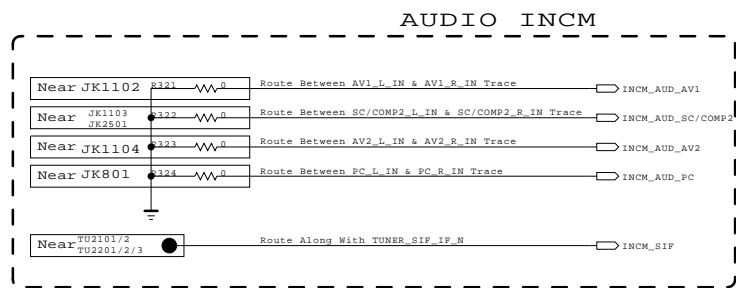
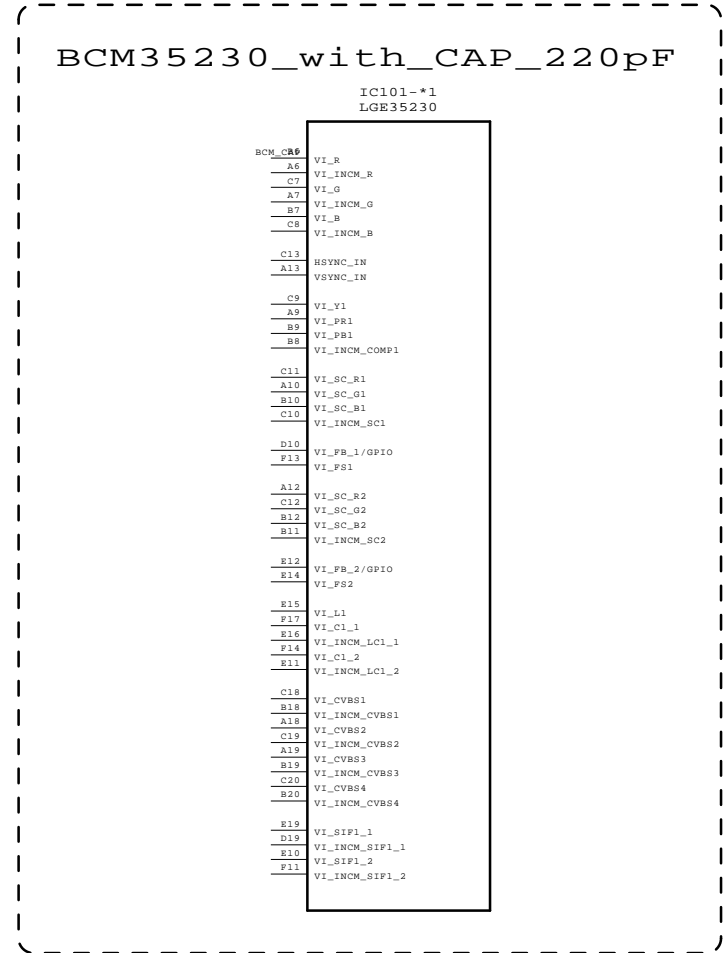
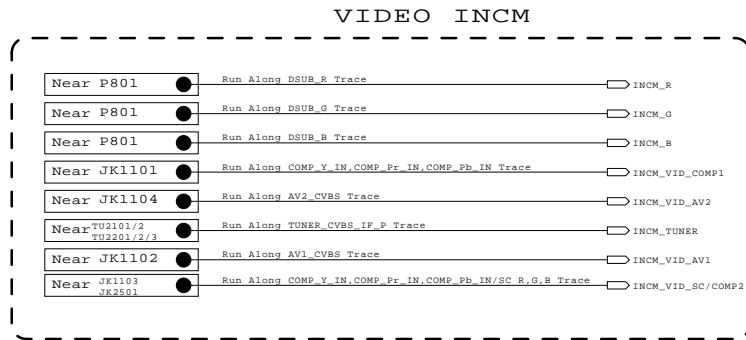
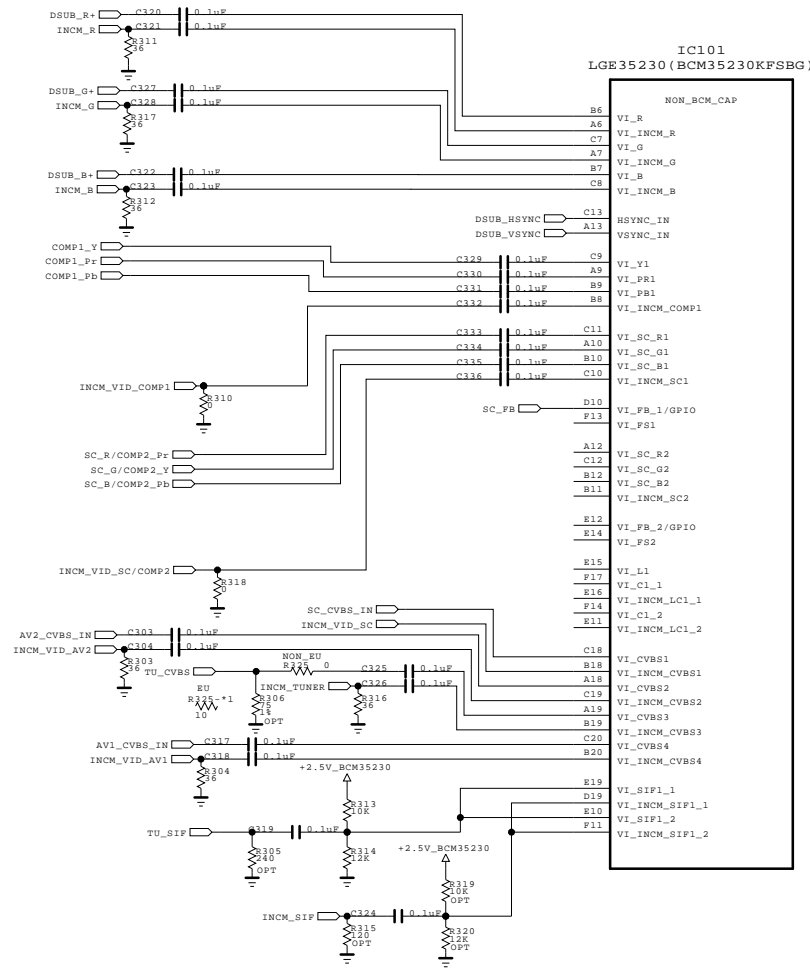
		HIGH	LOW
MODEL_OPT_2		FHD	HD
MODEL_OPT_3		OLED	LCD
MODEL_OPT_4	DDR speed	1333	1600
MODEL_OPT_5	T2 Tuner	Support	Not Support
MODEL_OPT_6	S Tuner	Support	Not Support
MODEL_OPT_7	PHM	Enable	Disable



SECRET
LG Electronics



MODEL	BCM35230	DATE	
BLOCK	MAIN POWER	SHEET	2 / 50



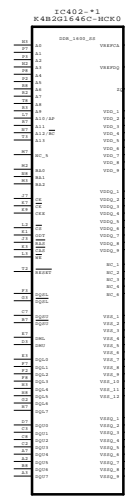
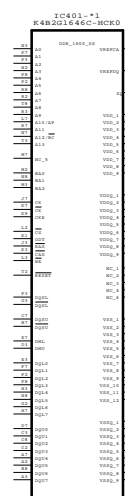
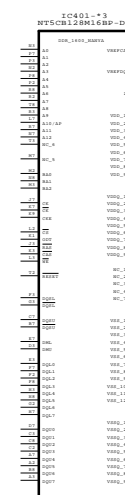
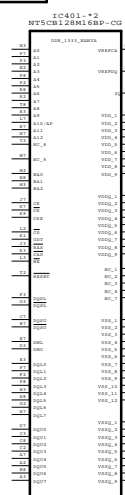
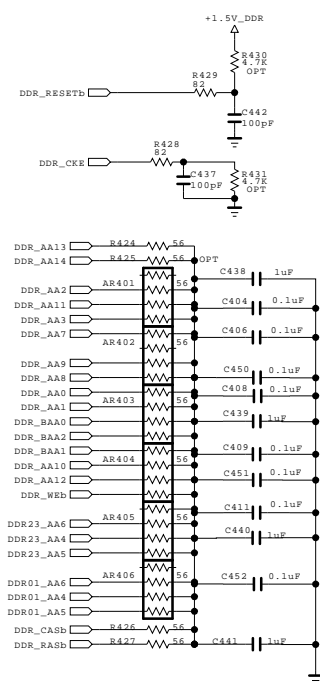
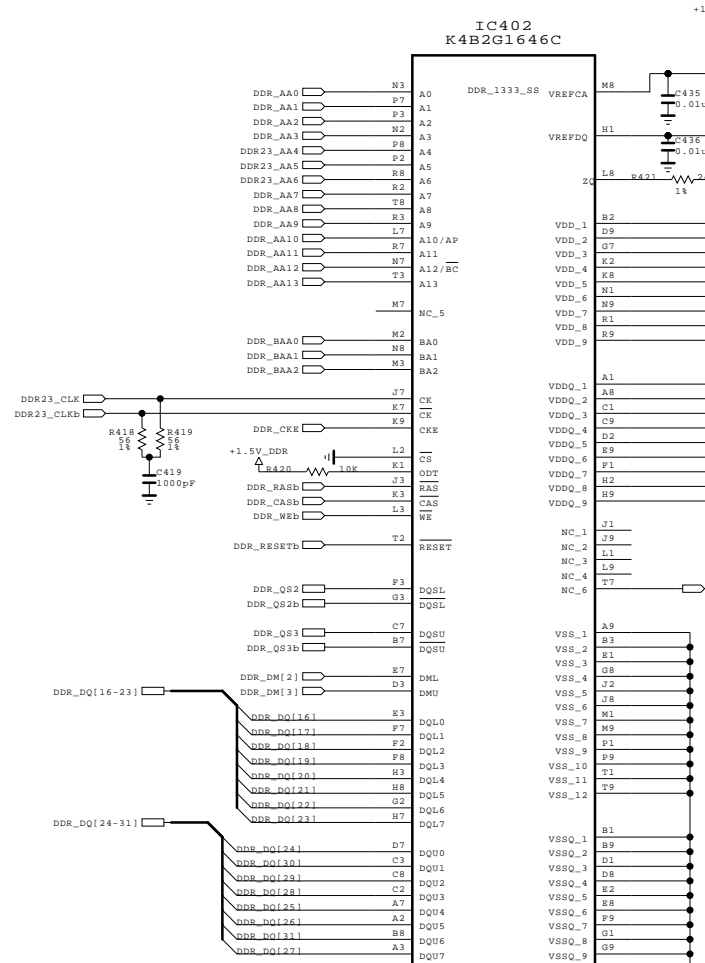
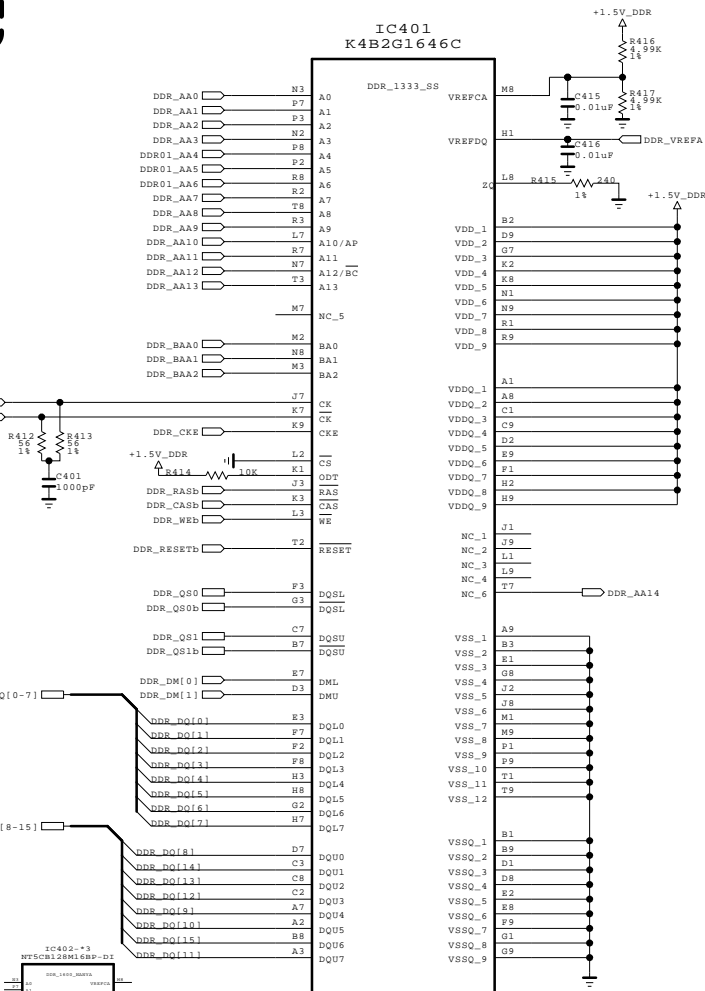
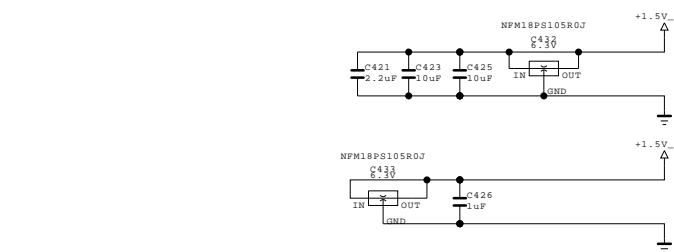
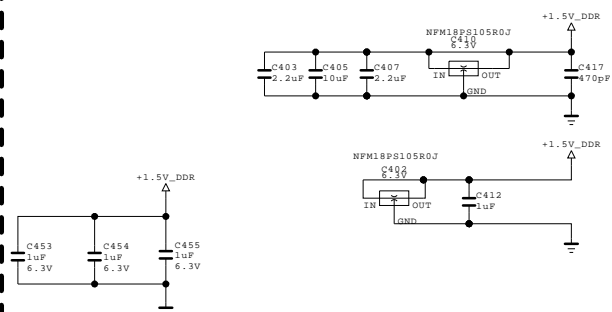
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics



MODEL	BCM35230	DATE	
BLOCK	MAIN AUDIO/VIDEO	SHEET	3 / 50

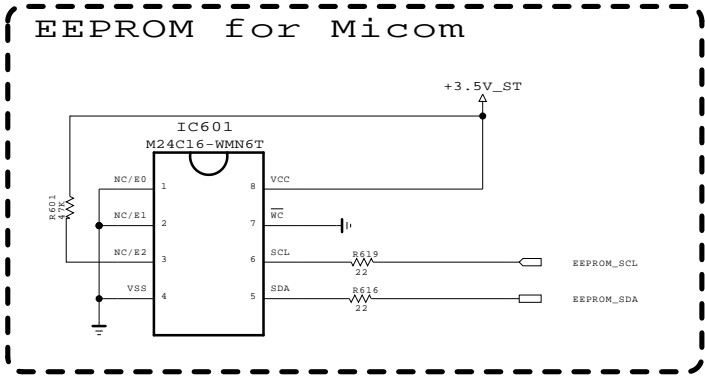
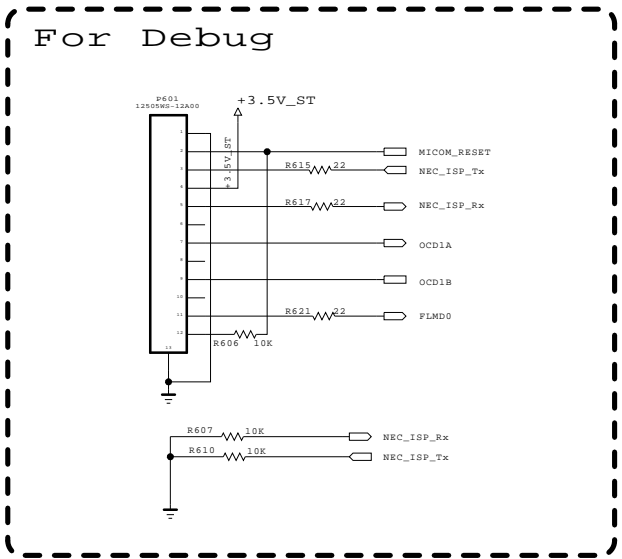
DDR STRAP



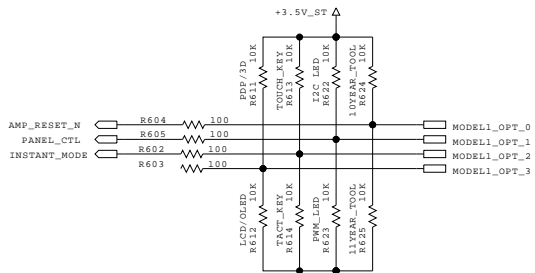
SECRET
LG Electronics



MODEL	BCM35230	DATE	
BLOCK	MAIN DDR	SHEET	4 / 50



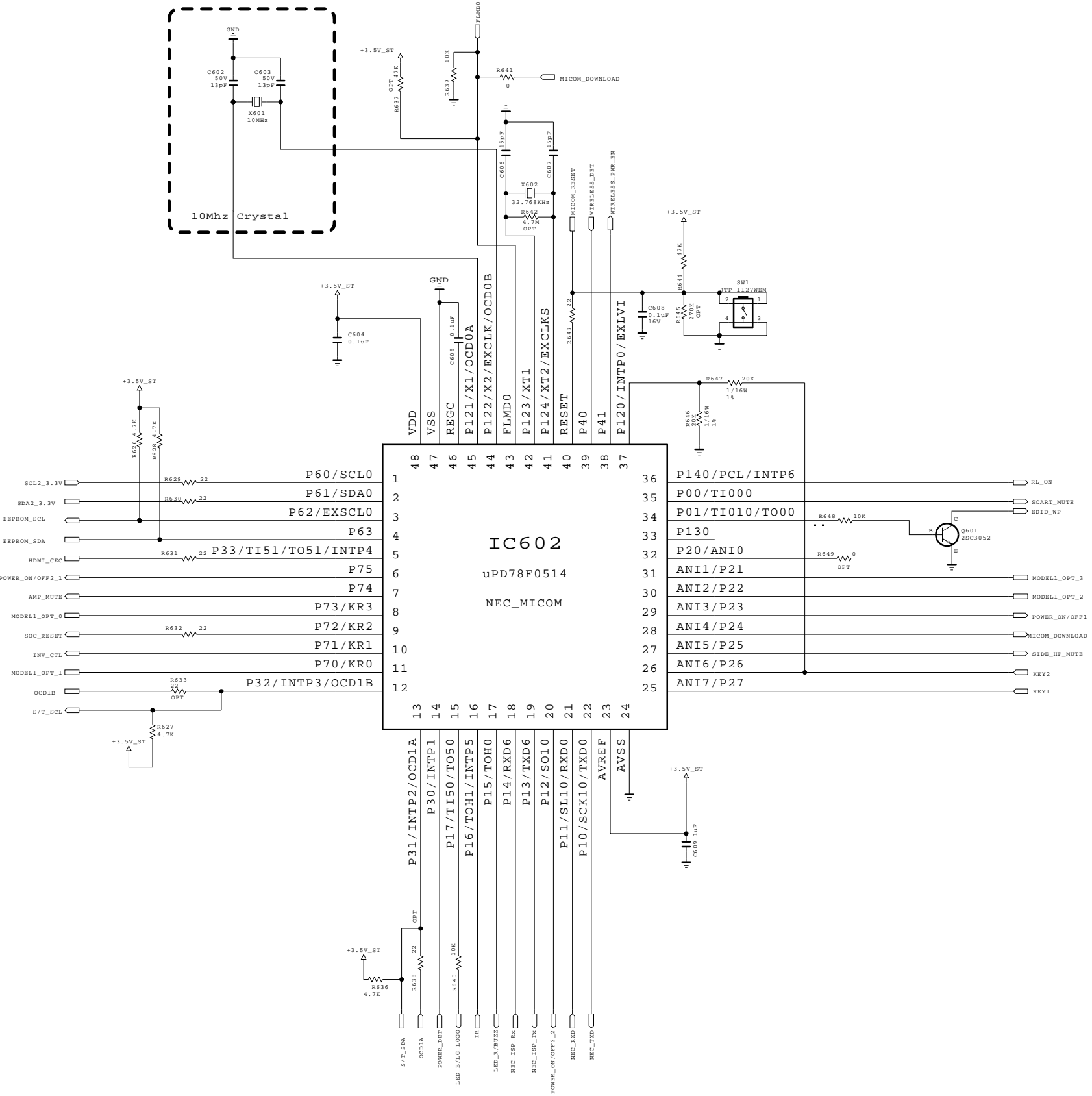
MICOM MODEL OPTION





MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	8	10YEAR_TOOL (10 SENSOR)	11YEAR_TOOL (11 SENSOR)
MODEL_OPT_1	11	I2C_LED	PWM_LED
MODEL_OPT_2	30	TOUCH_KEY	TACT_KEY
MODEL_OPT_3	31	PDP/3D	LCD/OLED

	LCD	PDP	OLED	3D
MODEL_OPT_3	0	1	0	1
	LOW	LOW_SMALL	TBD	HIGH
MODEL_OPT_1	0	0	1	1
MODEL_OPT_2	0	1	0	1

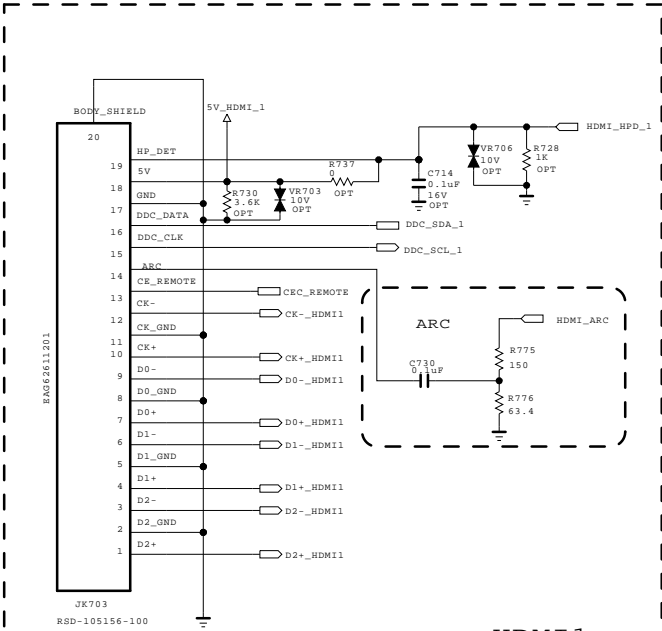


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

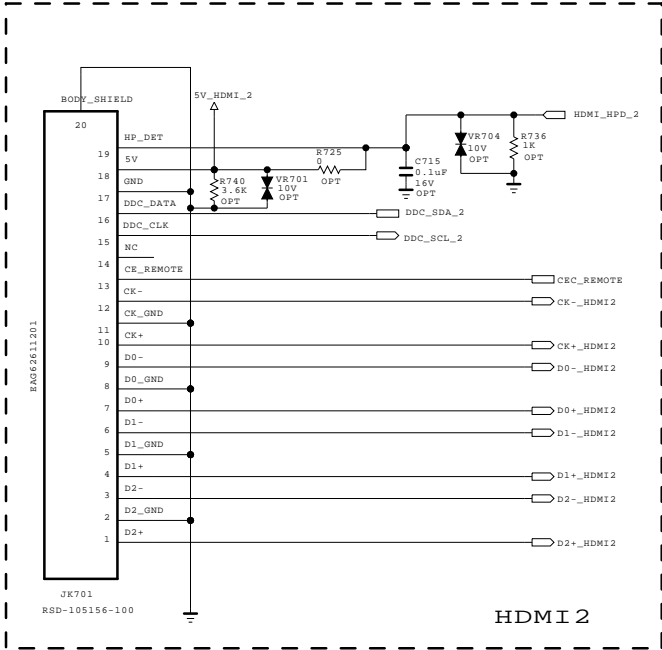
SECRET
LGElectronics



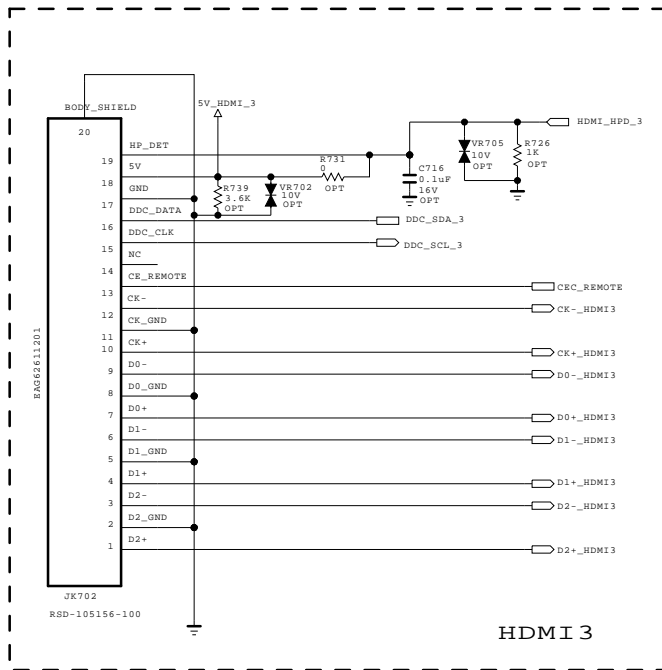
MODEL	BCM35230	DATE	
BLOCK	MICOM	SHEET	6 / 50



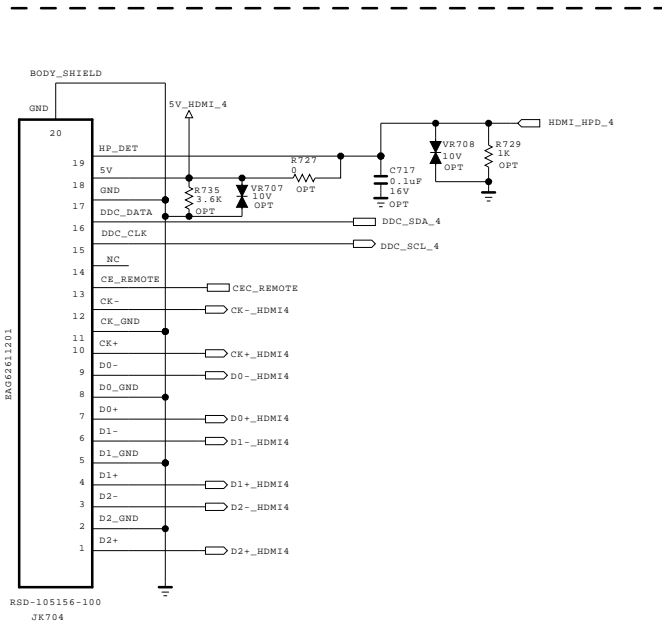
HDMI 1



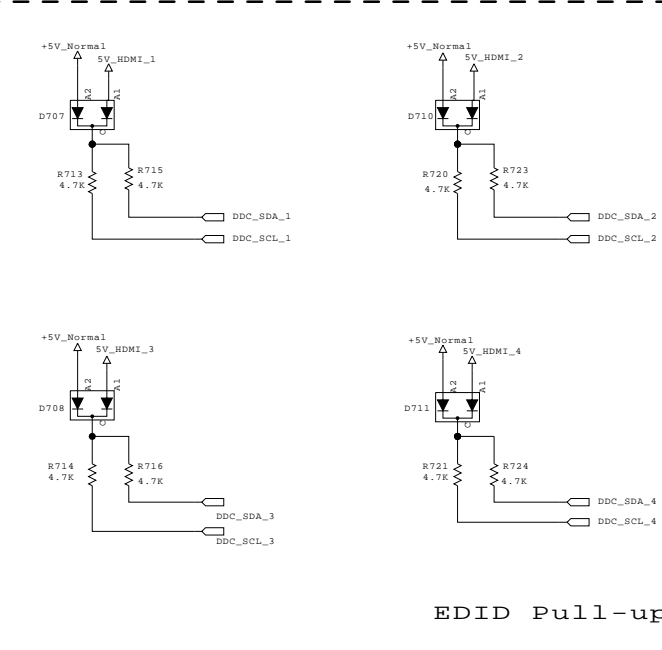
HDMI 2



HDMI 3



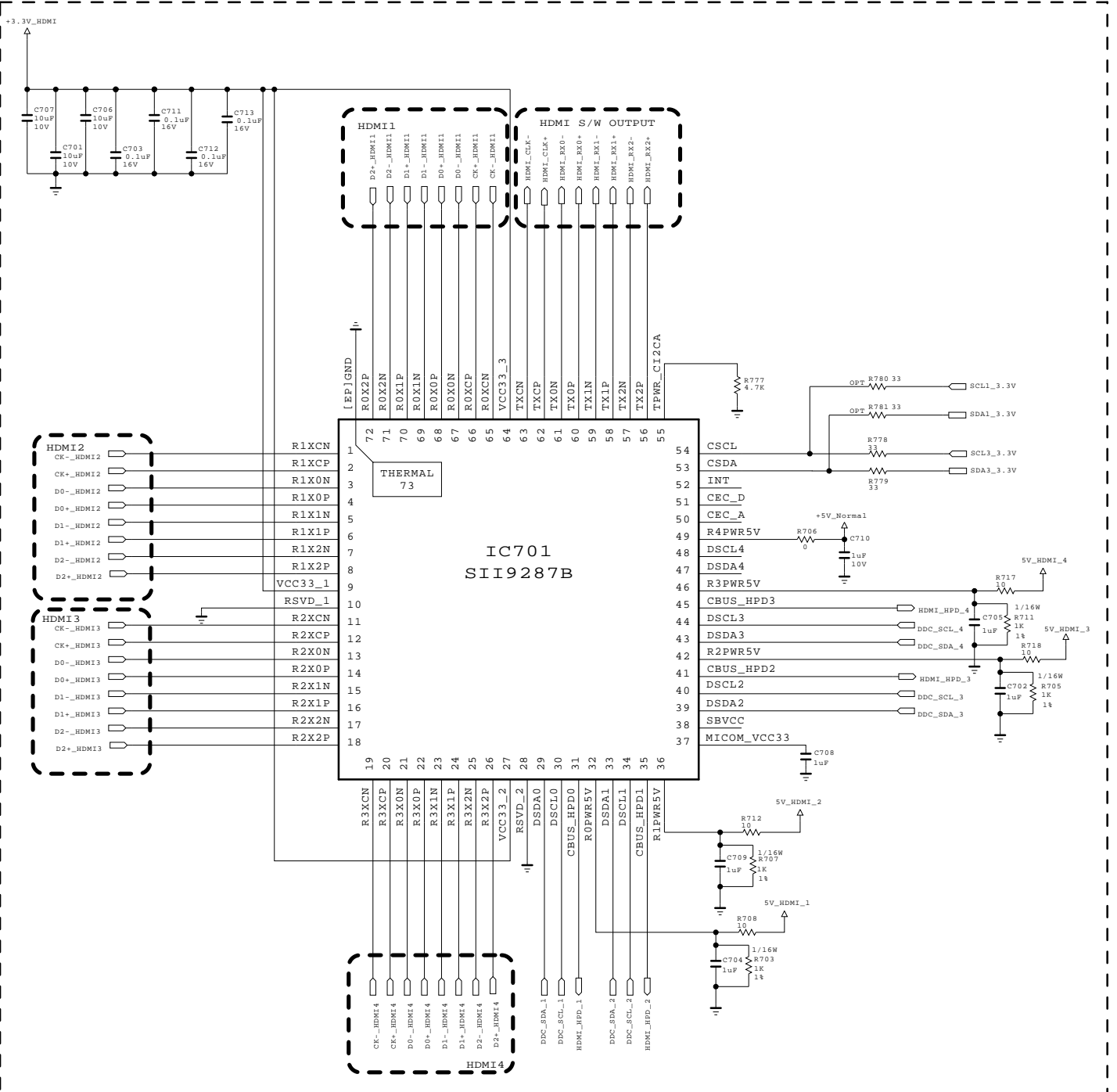
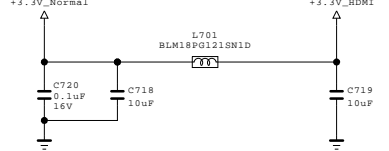
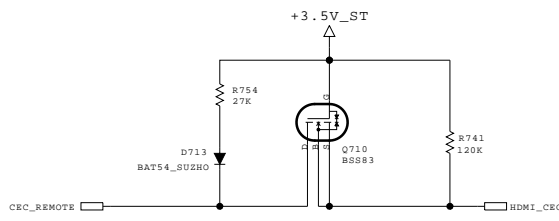
HDMI 4





EDID Pull-up

DUAL COMPONENT		
D707,D708 D710,D711	1ST : 0DD184009AA	2ND : 0DSIH00028A
D713	1ST : T-BAT54_SUZHO,	2ND : 0DSON00138A

* HDMI CEC



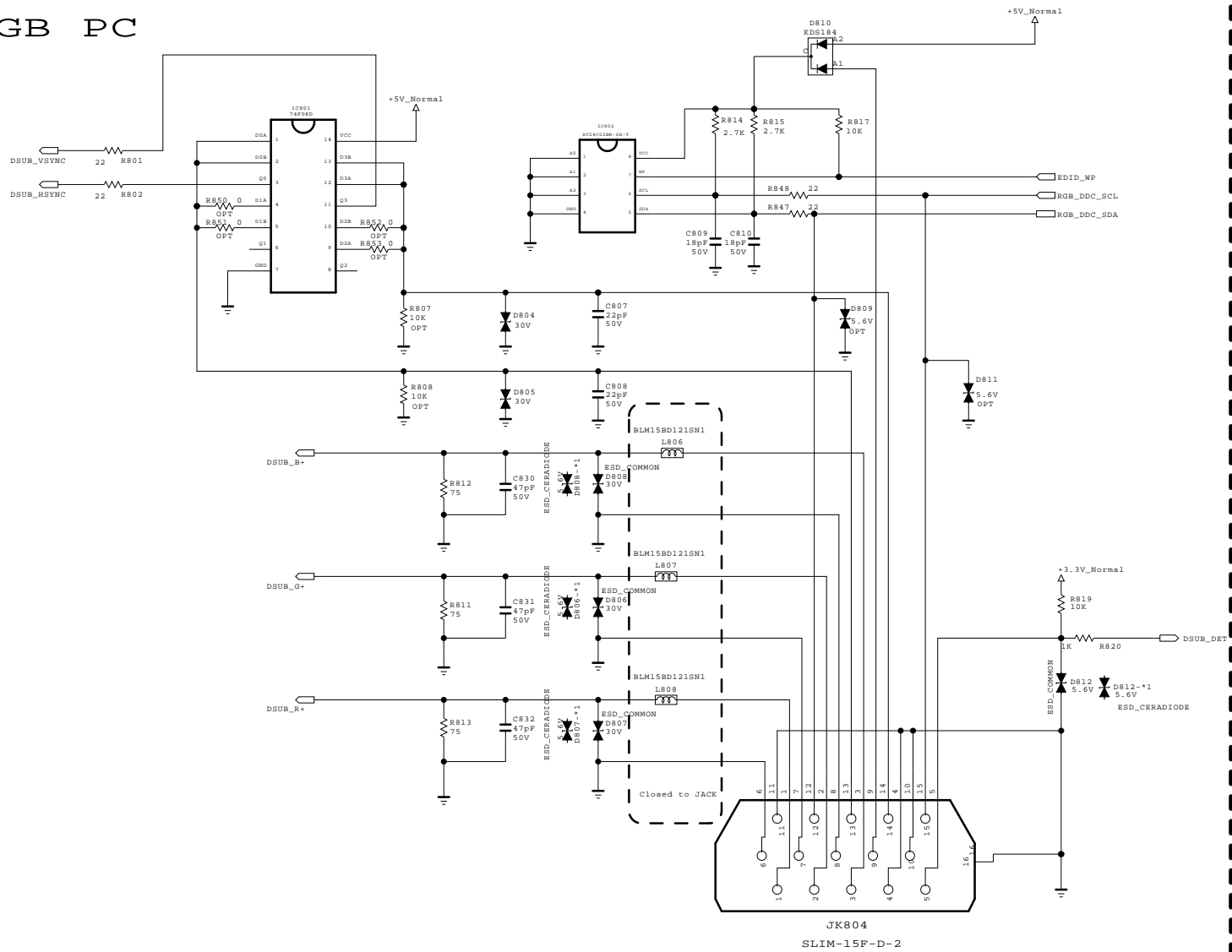
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILTRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics

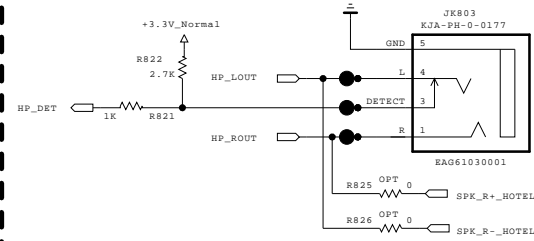


MODEL	BCM35230	DATE	
BLOCK	HDMI	SHEET	7 / 31

RGB PC

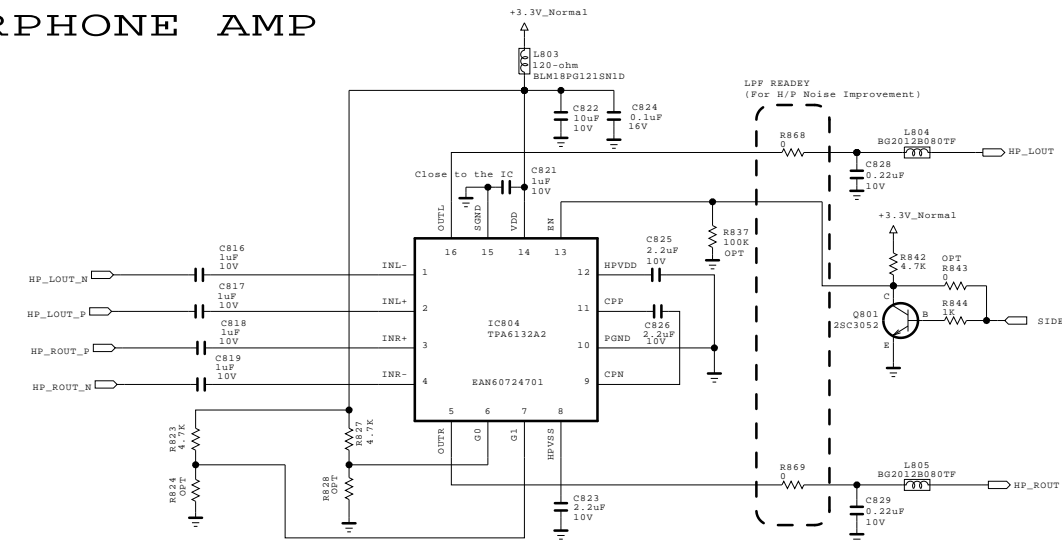


EARPHON JACK

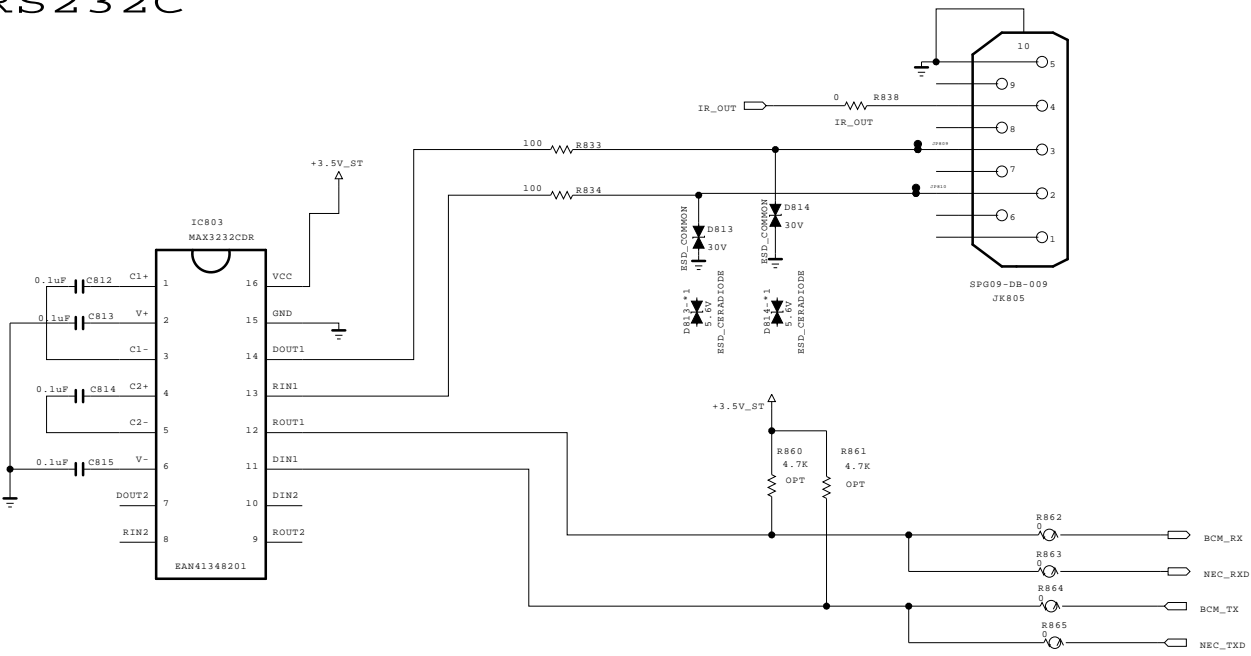


DUAL COMPONENT	
D804,D805,D806 D807,D808,D813 D814	1ST : EAH39491601, 2ND : EAH33945901
D810	1ST : ODD184009AA, 2ND : ODSIH00028A
Q801	1ST : OTRIY80001A, 2ND : OTR387500AA
IC805	1ST : EAN61151201, 2ND : EAN61130001

EARPHONE AMP

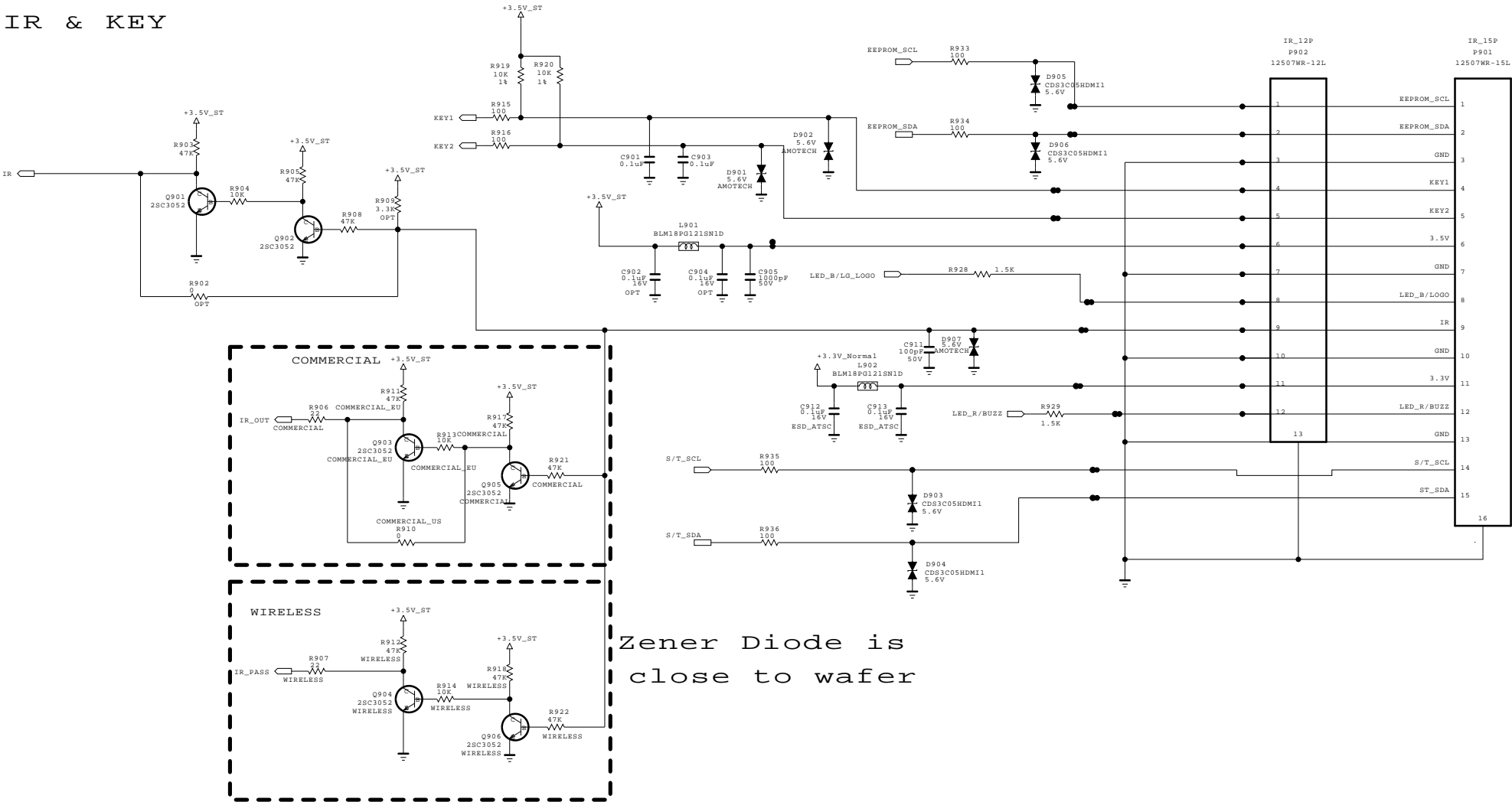




RS232C



DUAL COMPONENT	
Q901,Q902,Q903 Q904,Q905,Q906	1ST : OTRIY80001A 2ND : OTR387500AA
D903,D904 D905,D906	1ST : EAH42720601, 2ND : EAH60994401

IR & KEY



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SECRET
LGElectronics

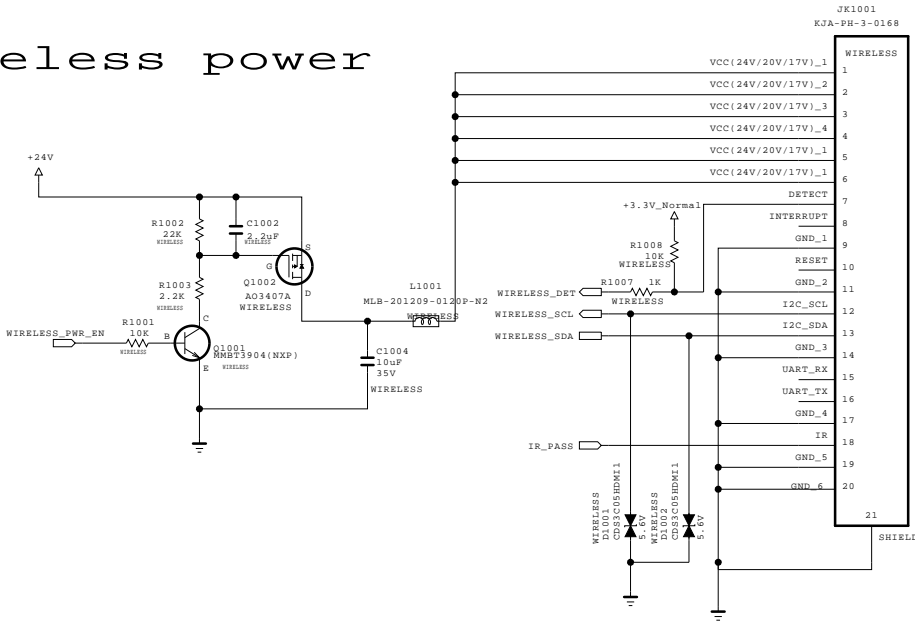


MODEL	BCM35230	DATE	
BLOCK	IR / KEY	SHEET	9 / 50

WIRELESS READY MODEL

DUAL COMPONENT		
D1001,D1002	1ST : EAH42720601	2ND : EAH60994401
Q1001	1ST : EBK61012601, 2ND : 0TRDI80002A	
Q1002	1ST : EBK60752501, 2ND : EBK61011501	

Wireless power



Wireless I2C connection with I2C_1
Address : 0X20

WIRELESS_SCL

WIRELESS_SDA

R1005

WIRELESS

R1006



WIRELESS

33

23

SCL2_3.3V

SDA2_3.3V

THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET

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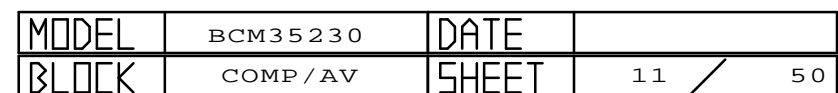
MODEL	BCM35230	DATE	
BLOCK	WIRELESS	SHEET	10 / 50

The schematic diagram illustrates the internal circuitry of the AV2 module, which interfaces with the JACK_PACK (JK1105, PPJ238-01) and the AV2 module (JK1104, PPJ233-01). The circuit includes several key components:

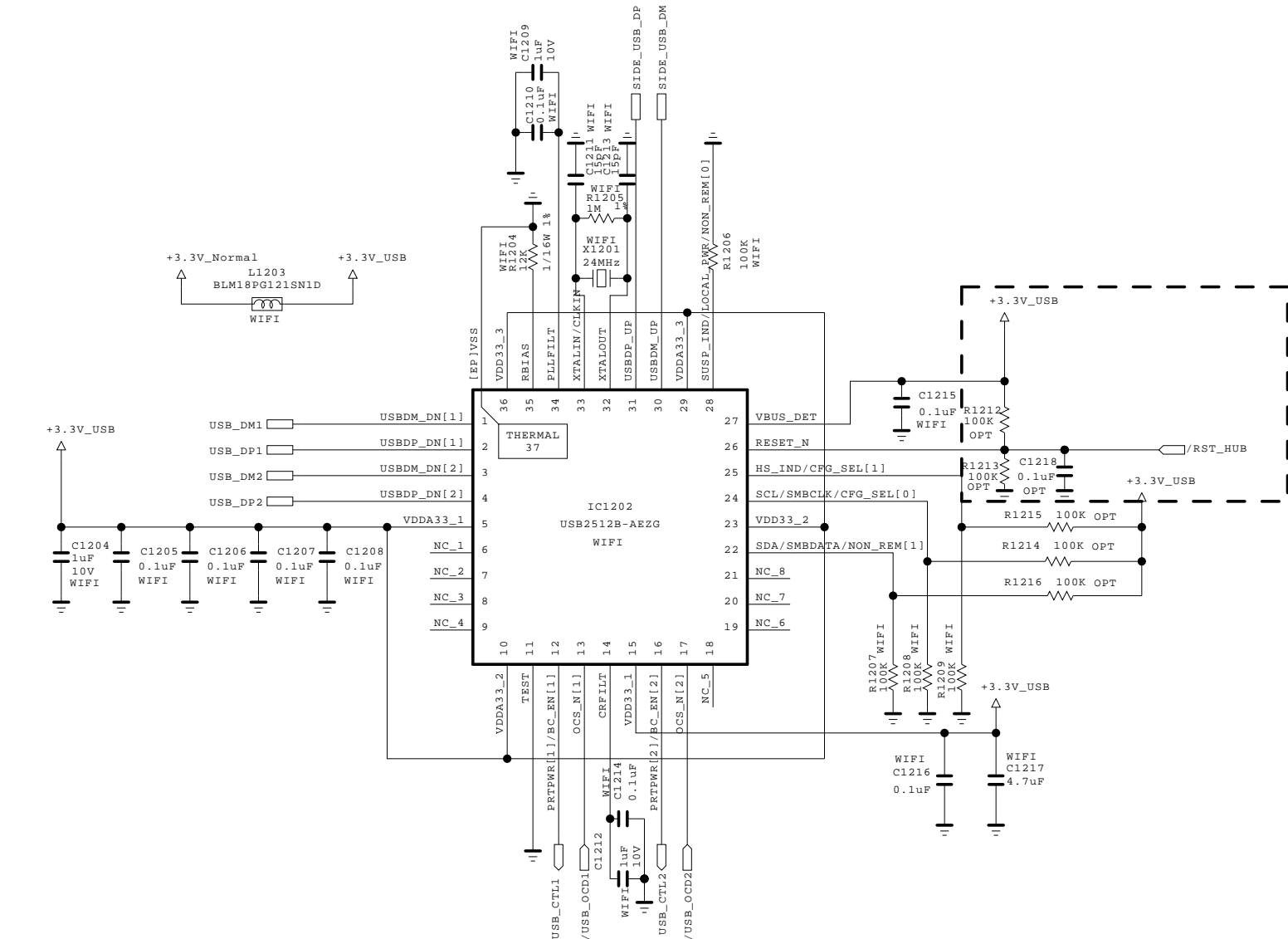
- Resistors:** R1109 (5.6V), R1116 (470K), R1117 (470K), R1118 (75), R1128 (2.7K), R1129 (1K), R1141 (22), and R1142 (10).
- Capacitors:** C1123 (560pF), C1124 (560pF), and C1120 (47pF).
- Diodes:** D1109 (5.6V), D1110 (5.6V), D1101 (5.1V), D1102 (5.1V), and D1111 (5.6V).
- Voltage Source:** +3.3V_Nominal.

The module has four output pins: AV2_R_IN, AV2_L_IN, AV2_CVBS_IN, and AV2_CVBS_DET. The circuit is designed to process audio signals from the JACK_PACK and output them through the AV2 module.

SECRET
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The schematic diagram illustrates the electrical connection between a USB interface and a WIFI module. The USB interface is represented by a dashed box containing an L-match network (L1202, WIFI120-ohm) and a matching network (MLB-201209-0120P-N2). It includes two 0.1uF 16V capacitors (C1234 and C1233) for decoupling and a 100uF 16V capacitor (C1232) for EMI filtering. The WIFI module is represented by a solid box labeled P1201 12507WR-04L. It has four pins: 1 (VDD), 2 (DM), 3 (DP), and 4 (GND). The DM and DP pins are connected to the USB interface through 0-ohm resistors (R1232 and R1233) and are also connected to the WIFI module. The GND pin is connected to the WIFI module. The WIFI module also includes two 5.6V diodes (D1201 and D1202) for ESD protection, labeled WIFI_ESD.



12

USB / DVR Ready

3AU04S-305-ZC-(LG) JK1201

IC1204 AP2191B8G

MLB-201209-0120P-N2

L1205 120-ohm

C1220 10uF 10V

C1231 100uF 16V

+3.3V_Normal

R1221 4.7K OPT

R1223 2.7K

USB_CTL1

/USB_OCD1

R1230 0

R1231 0

NON_WIFI

SIDE_USB_CTL1

SIDE_USB_OCD1

USB_DM1

USB_DP1

R1224 0

R1225 0

NON_WIFI

SIDE_USB_DM

SIDE_USB_DP

D1207 RCLAW0502BA

D1203 CDS3C05HDM1 5.6V

D1205 CDS3C05HDM1 5.6V

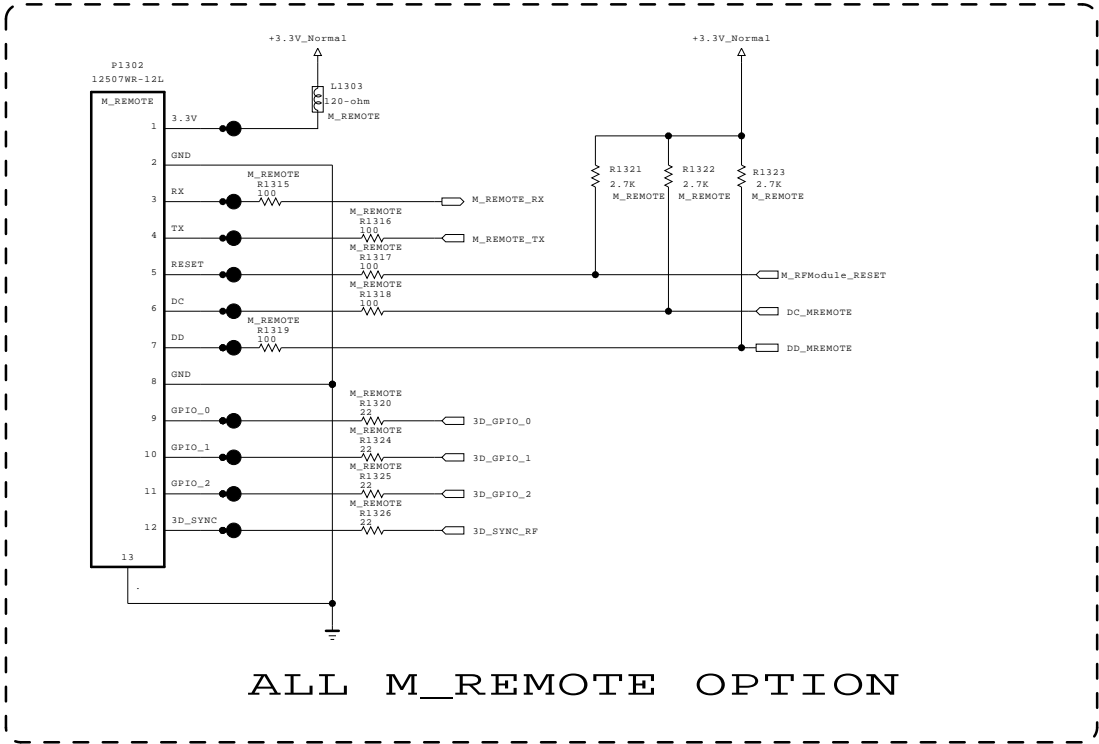
+5V_USB

C1224 0.1uF



[illegible]

LGE Internal Use Only

TI solution M_REMOTE OPTION



ALL M_REMOTE OPTION

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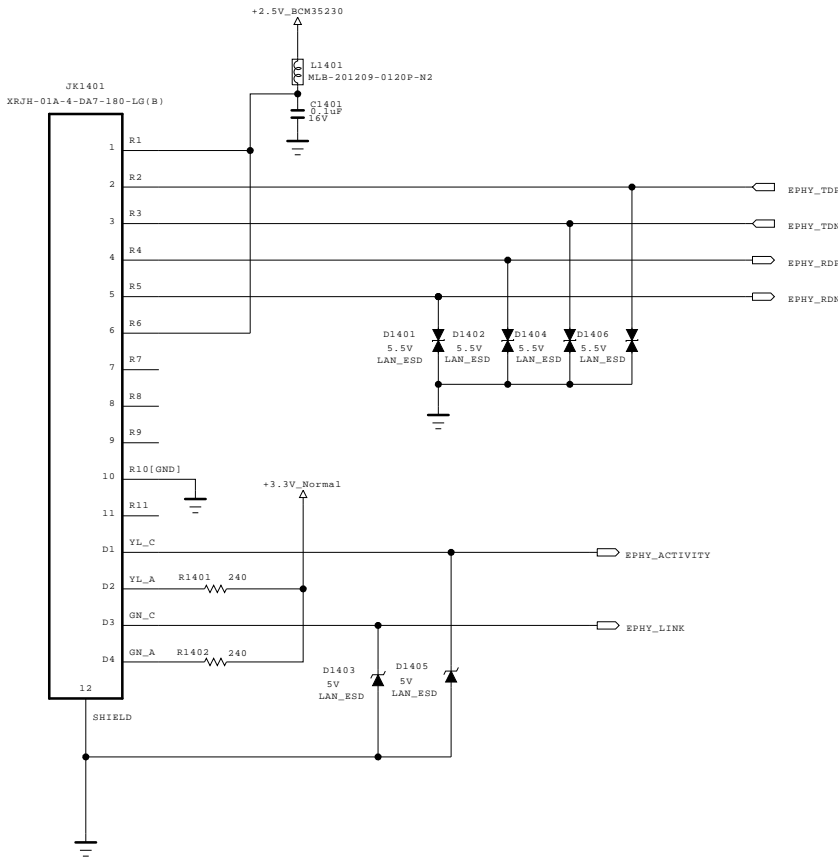
SECRET
LGElectronics





MODEL	BCM35230	DATE	
BLOCK	M_REMOCON	SHEET	13 / 50

Ethernet Block

DUAL COMPONENT	
D1401,D1402 D1403,D1404 D1405,D1406	1ST : EAH42720601 2ND : EAH60994401



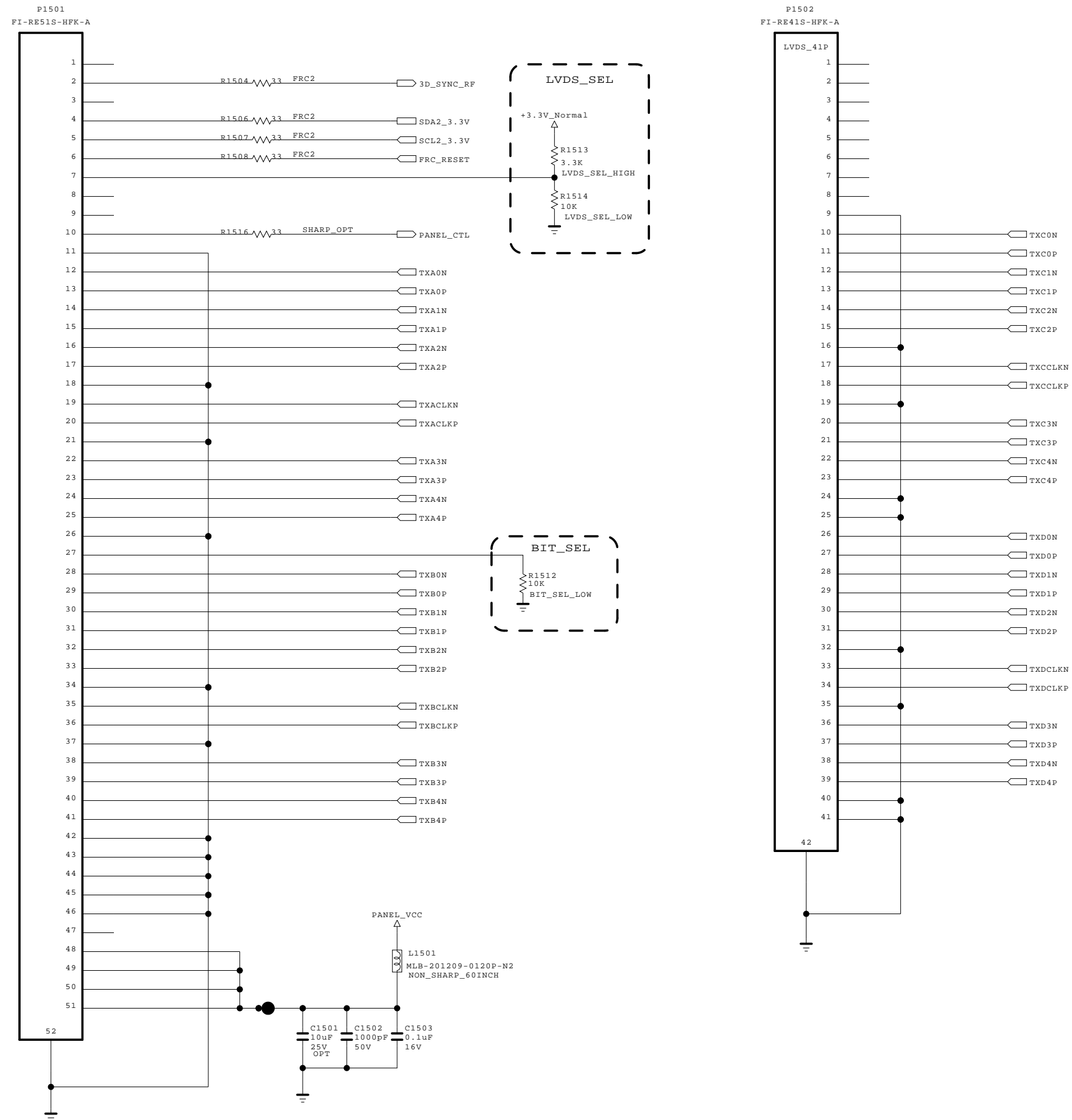
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SECRET
LGElectronics




MODEL	BCM35230	DATE	
BLOCK	ETHERNET	SHEET	14 / 50



FHD120Hz LVDS output (51pin+41Pin)



REVERSE MARK

LVDS_41P

 C1504
2.2uF
50V

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SECRET

LG Electronics



MODEL

BCM35230

BLOCK

LVDS

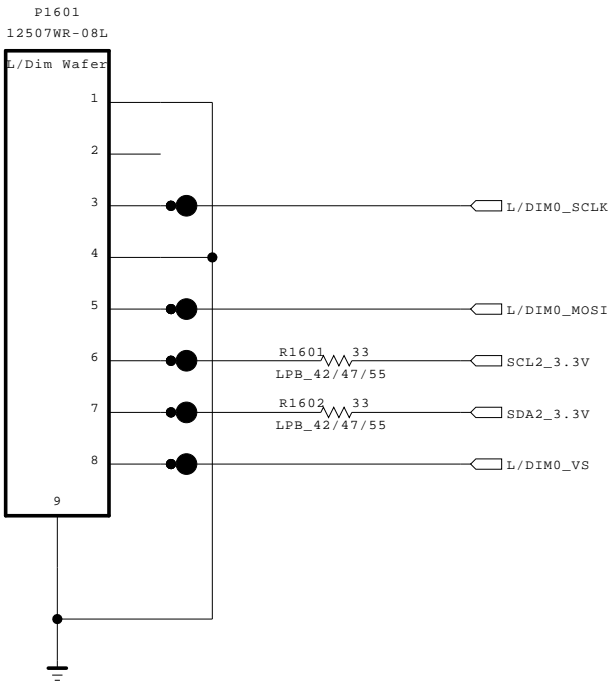
DATE



2010.11.03

SHEET

$$15 \quad / \quad 50$$

[Local Dimming Block]



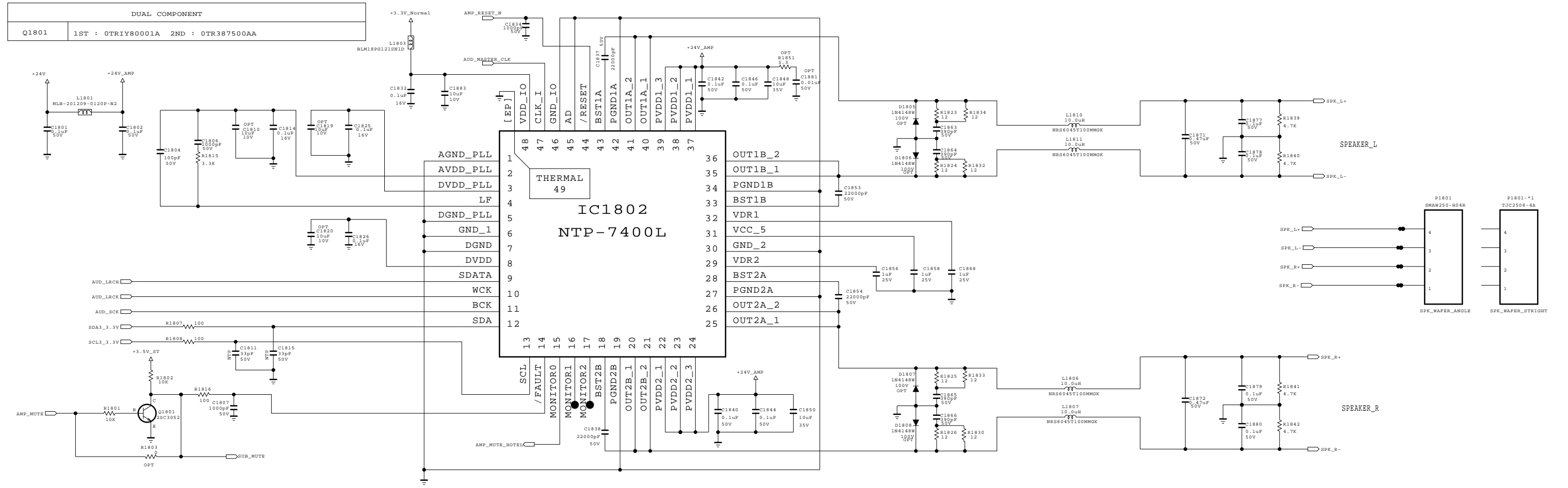
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SECRET

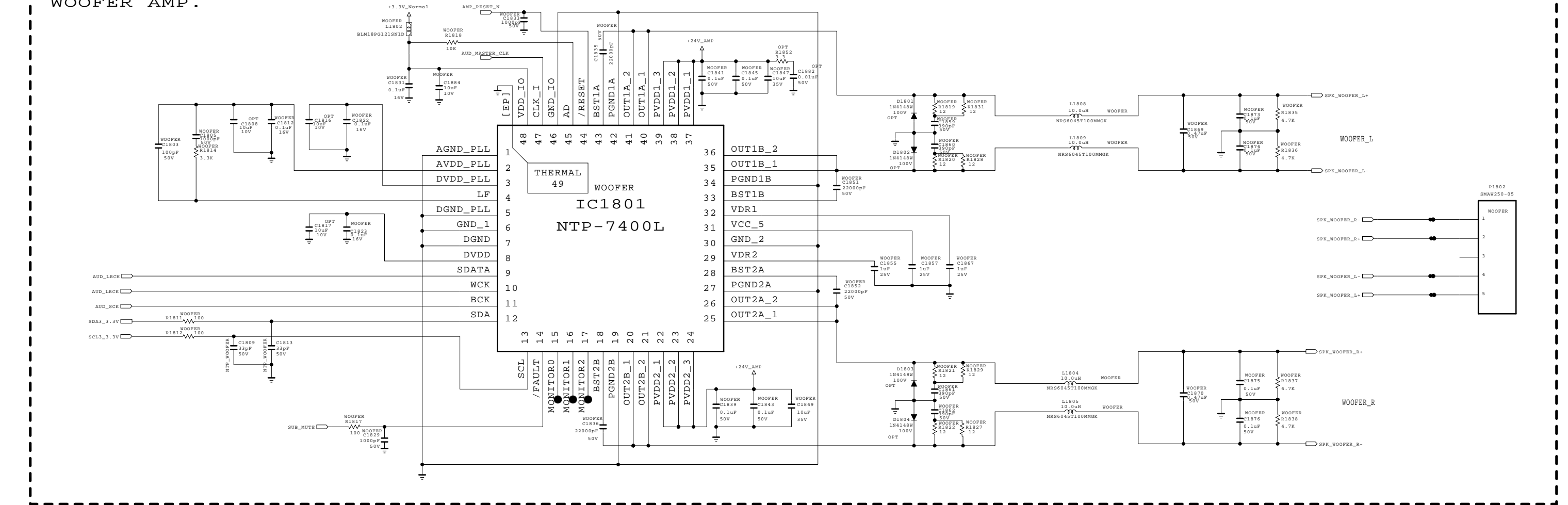
LGElectronics

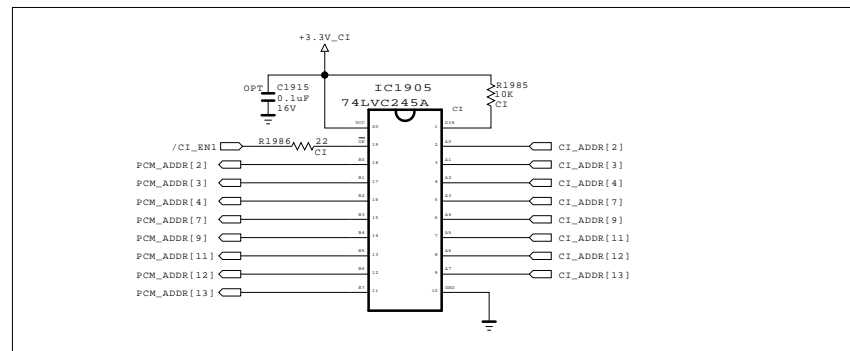
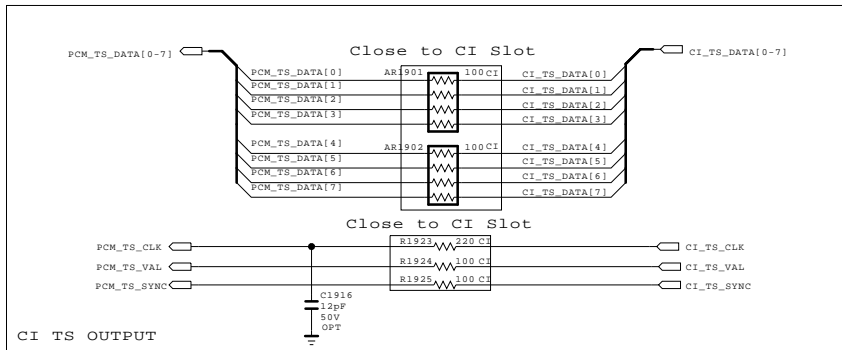
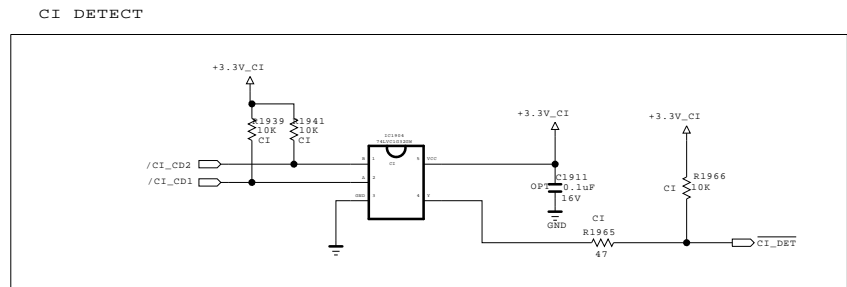
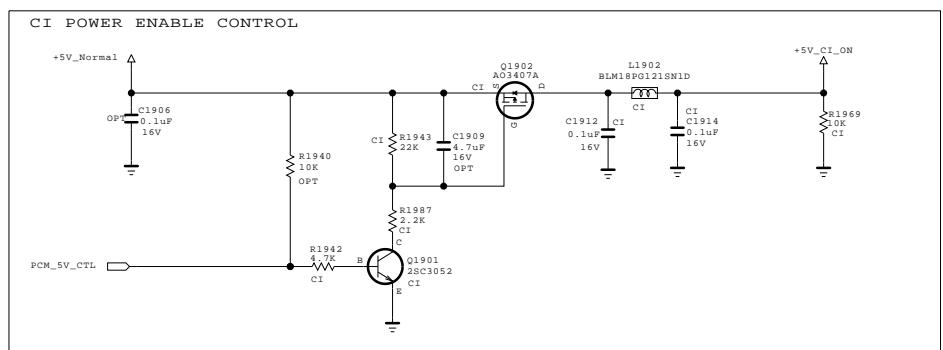
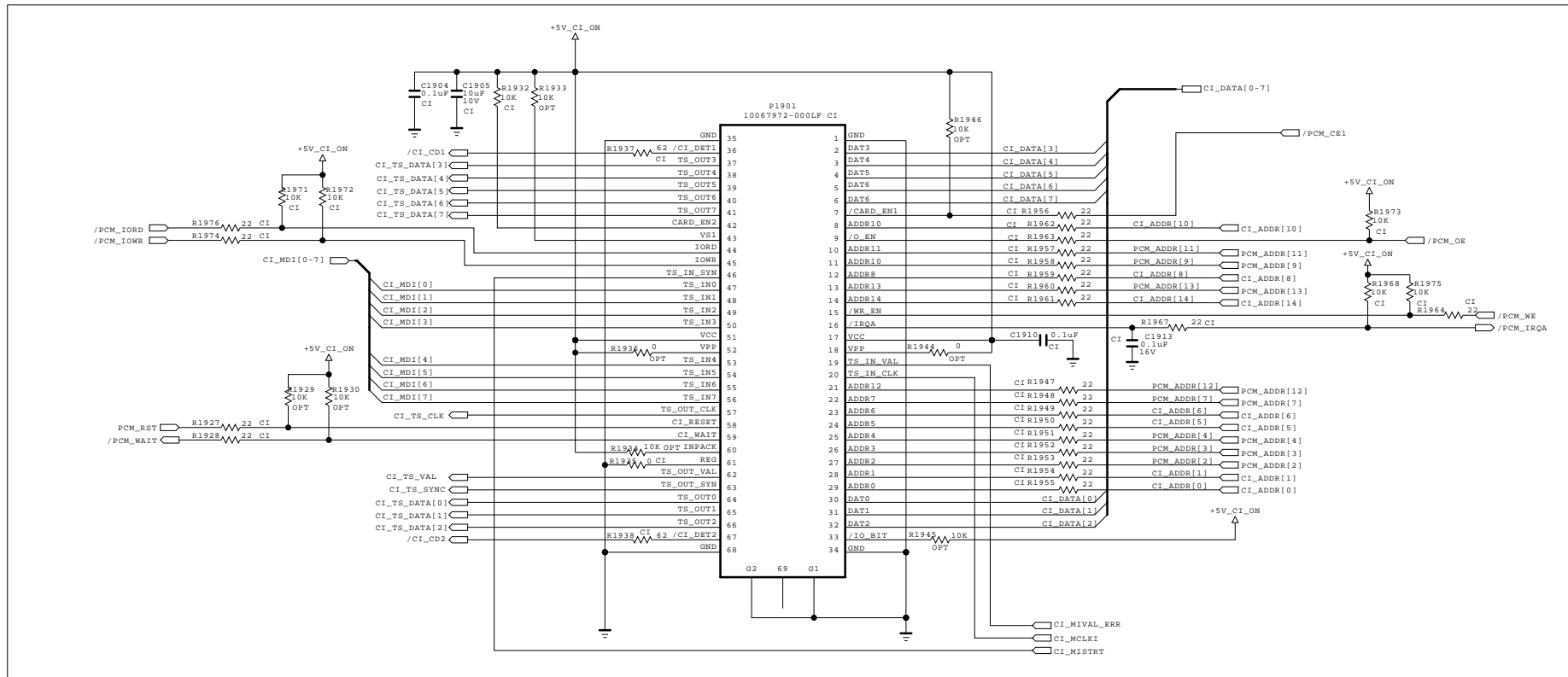
 LG ELECTRONICS

MODEL	BCM35230	DATE	
BLOCK	L_DIMMING	SHEET	16 / 50

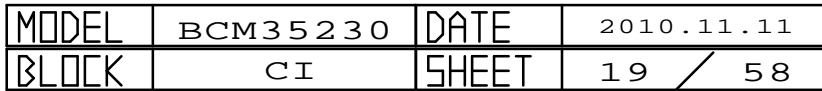


WOOFER AMP .





SECRET
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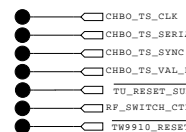
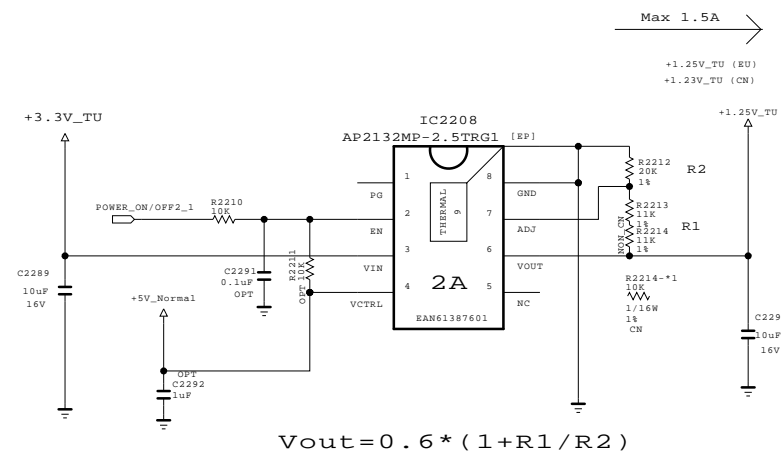
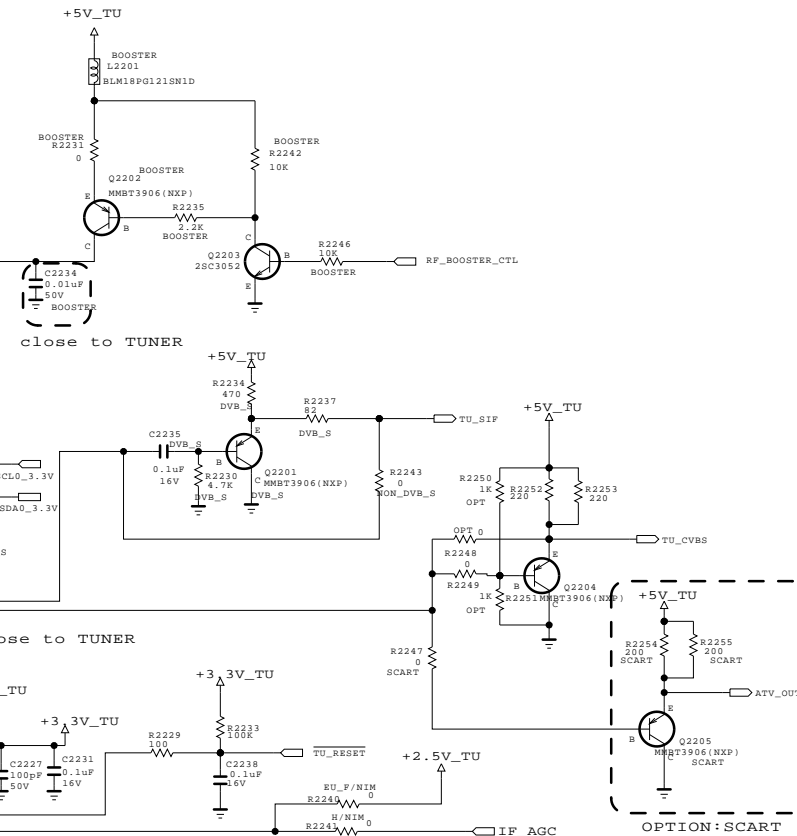


DUAL COMPONENT	
IC2204	1ST:T-AP2114H(EAN61573601) / 2ND:T-TJ3940S (EAN61573501)

```

NON_DVB_S: use H/NIM and F/NIM
    DVB_S: use DVB-T/C/S2 combo Tuner
H/NIM: use H/NIM
F/NIM: use F/NIM and DVB-T/C/S2 combo Tuner
SCART: use SCart Jack
    CN : use China F/NIM
BOOSTER: use BOOSTER_CTL
RF_SW_CTL: use RF_SWITCH_CTL
TC_S_P/NIM: use EU_DVB-T/C F/NIM
CN_F/NIM_BR: use F/NIM(China, BR2IL)
EU_F/NIM: use EU_F/NIM

```

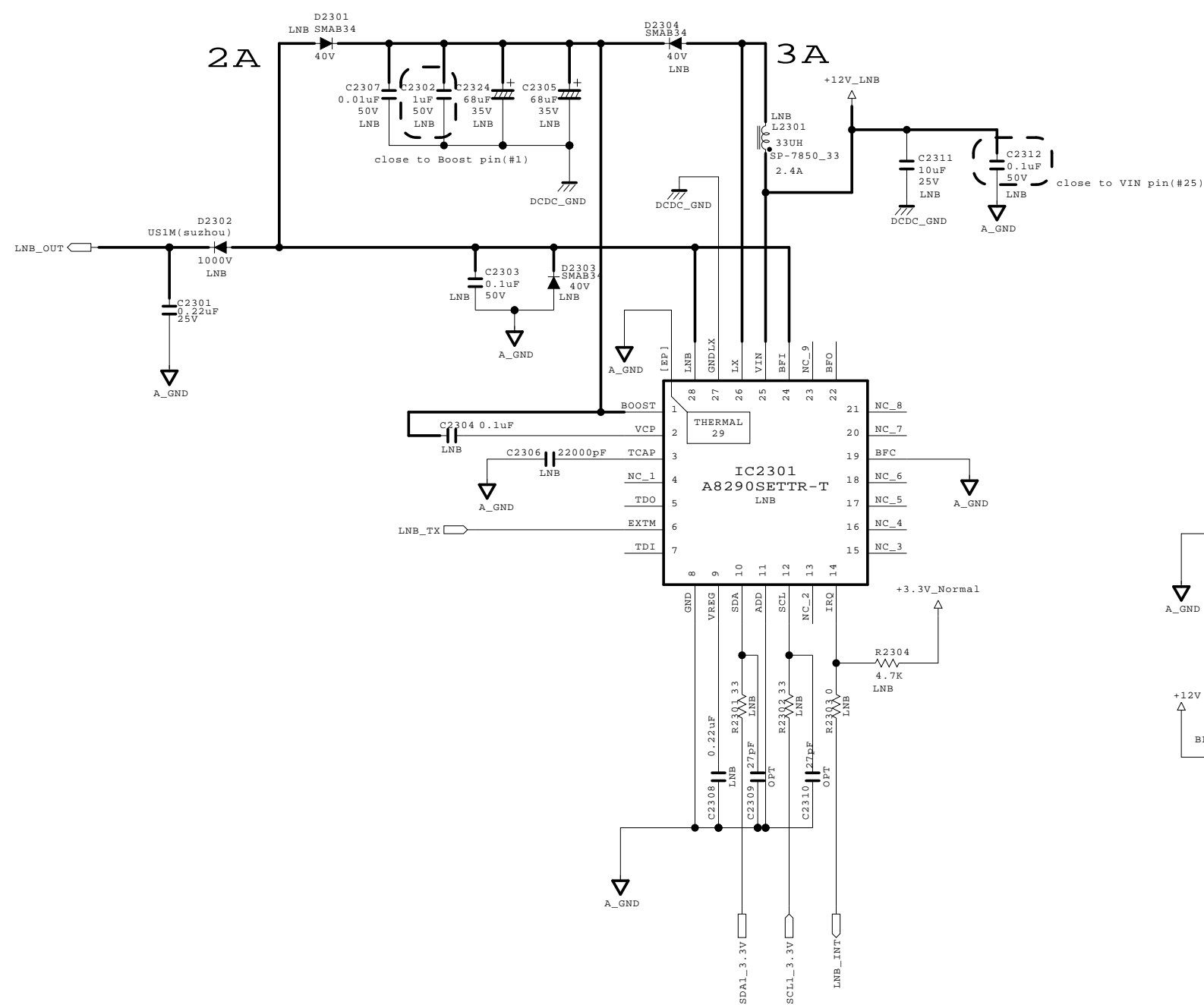


SECRET
LGElectronics



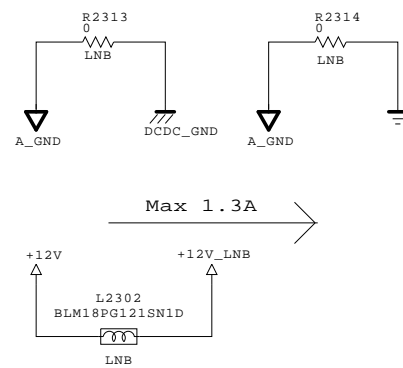
DVB-S2 LNB Part Allegro



(Option:LNB)



DCDC_GND and A_GND are connected
DCDC_GND and A_GND are connected in pin#27
PCB_GND and A_GND are connected

Input trace widths should be sized to conduct at least 3A
Ouput trace widths should be sized to conduct at least 2A



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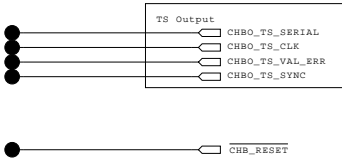
SECRET



LG Electronics

 LG ELECTRONICS

MODEL	BCM35230	DATE	2010.11.02
BLOCK	LNB	SHEET	23 / 57

NON CHB



THE  SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMETIC.

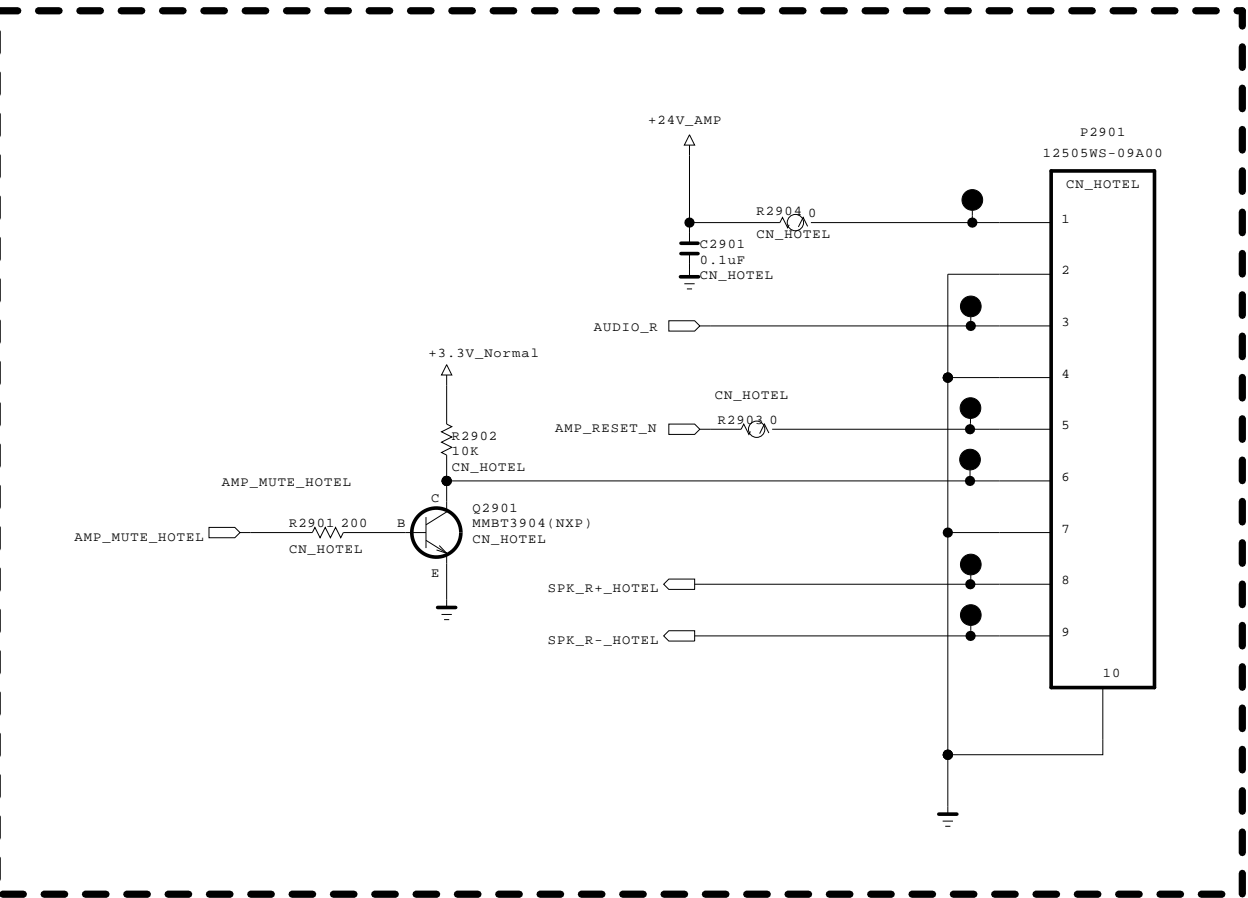
SECRET
LGElectronics





MODEL	BCM35230	DATE	
BLOCK	NON CHB	SHEET	28 / 50

China Hotel Option

DUAL COMPONENT	
Q2901	1ST : EBK61012601 2ND : 0TRDI80002A



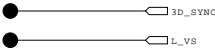
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SECRET

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 LG ELECTRONICS

MODEL	BCM35230	DATE	
BLOCK	CHINA HOTEL	SHEET	29 /



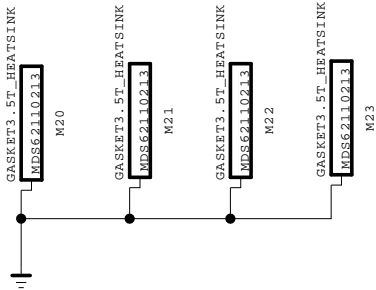
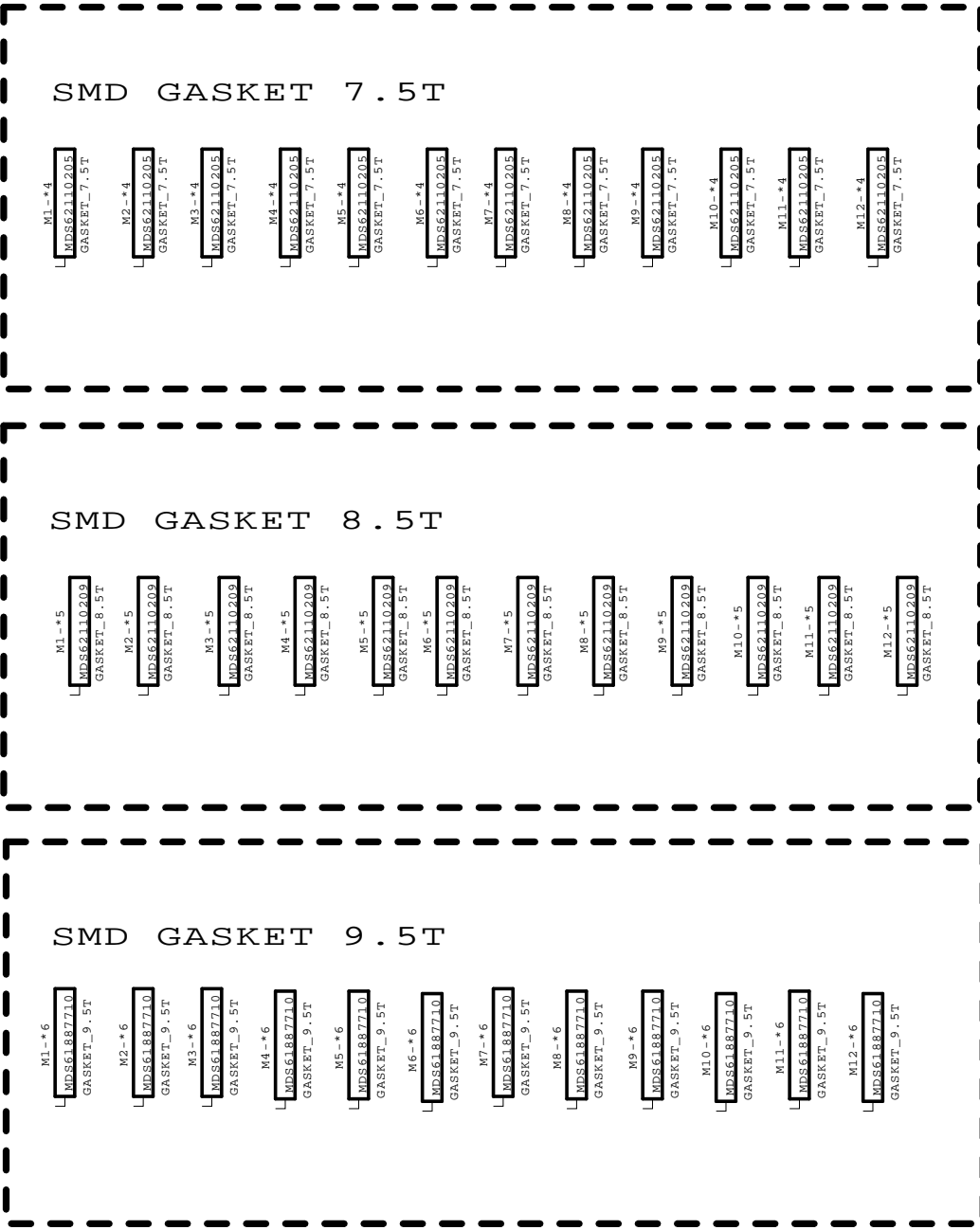
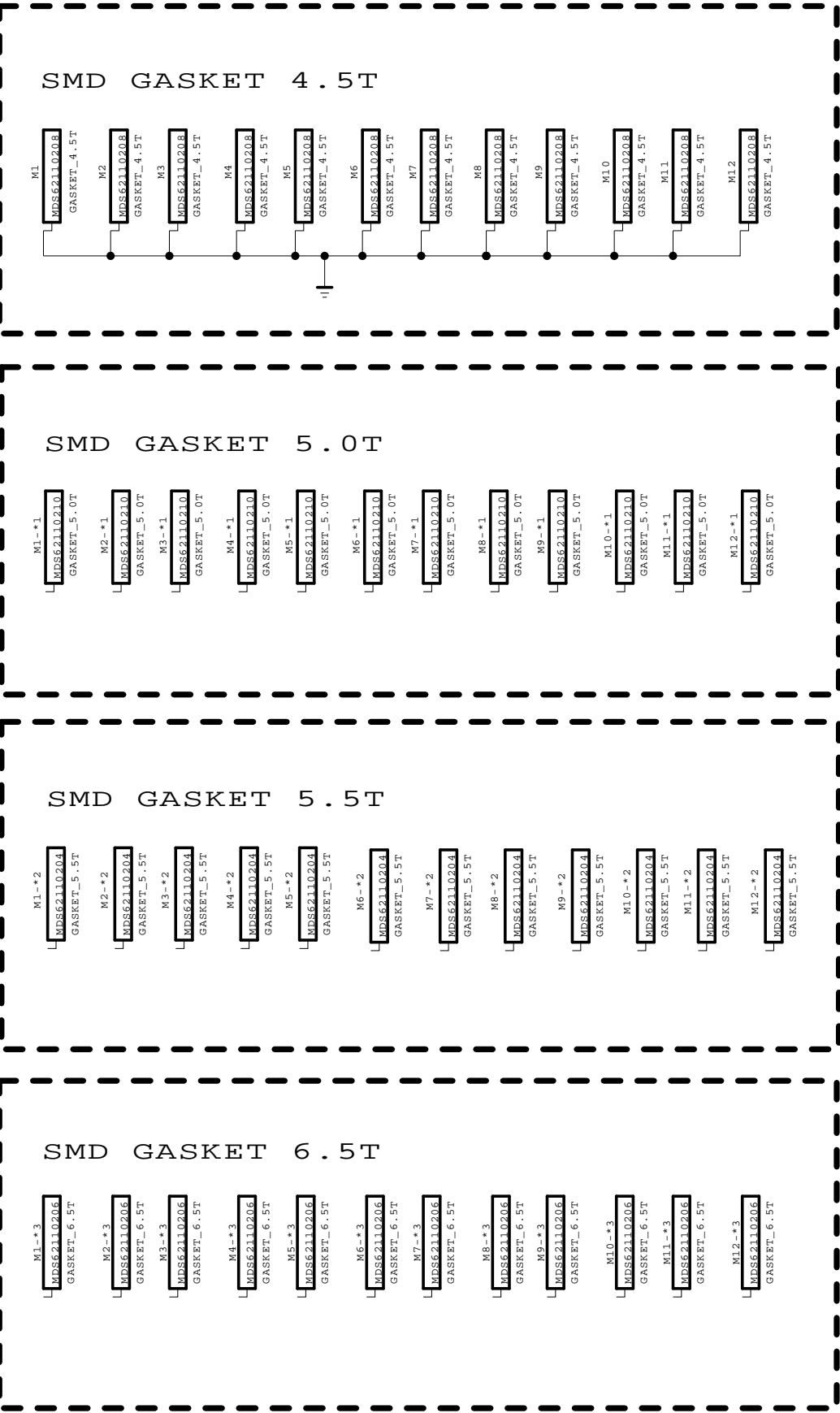
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SECRET
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MODEL	BCM35230	DATE	
BLOCK	NON URSA	SHEET	36 / 50

SMD GASKET



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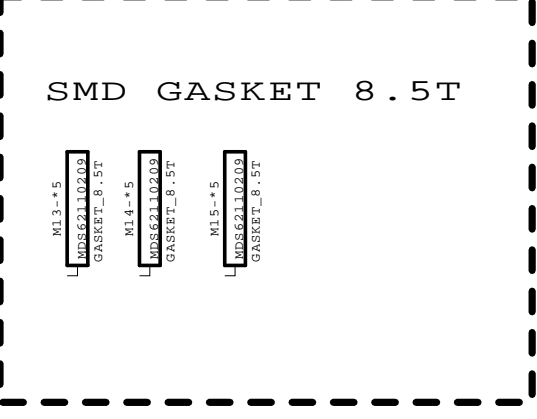
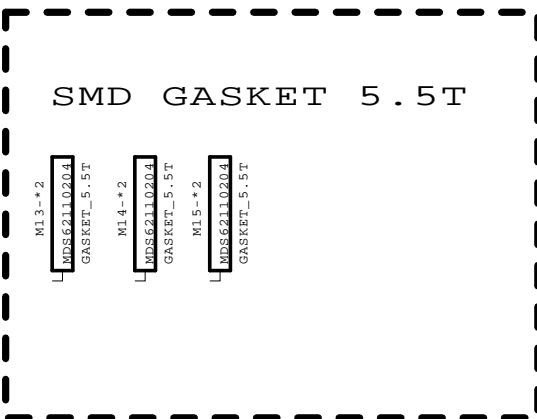
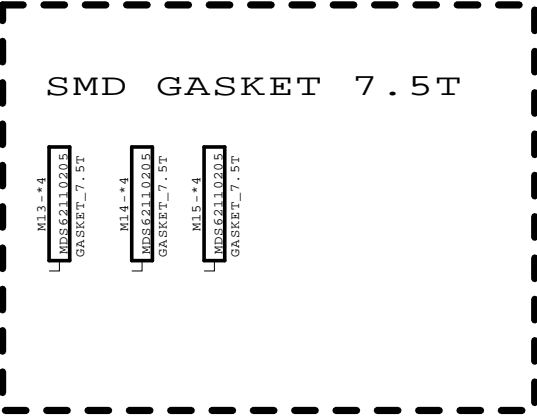
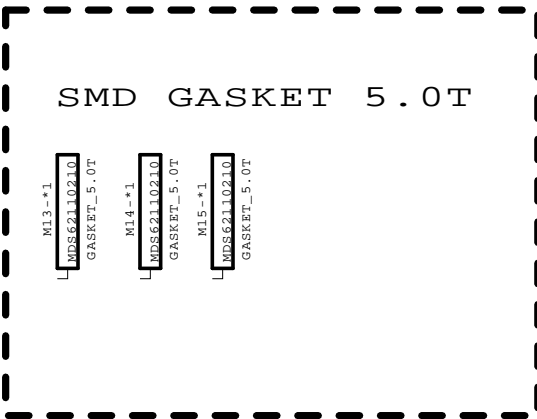
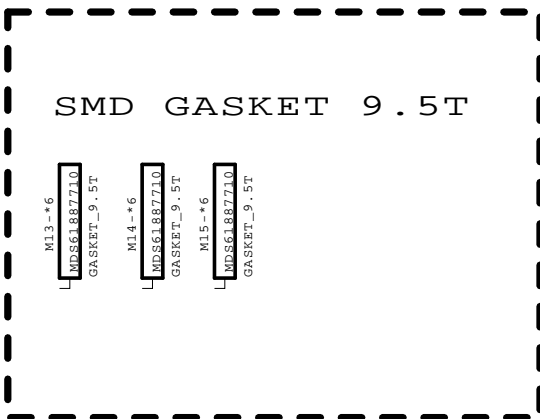
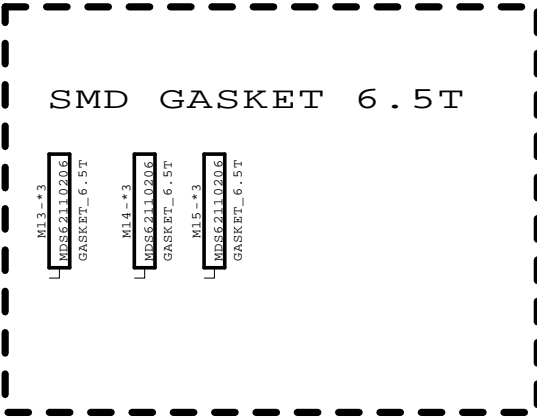
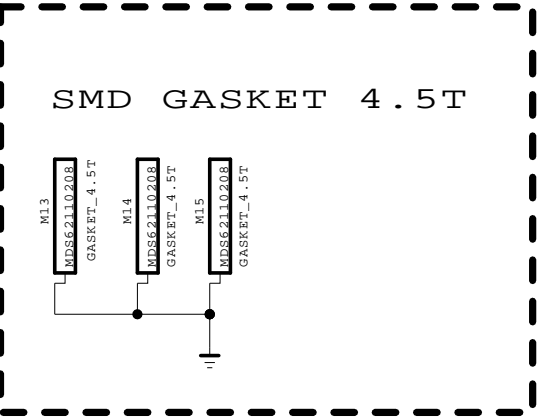
SECRET



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MODEL	BCM35230	DATE	2010. 09. 18
BLOCK	SMD GASKET	SHEET	56 / 56

SMD GASKET (UNDER THE TUNER)



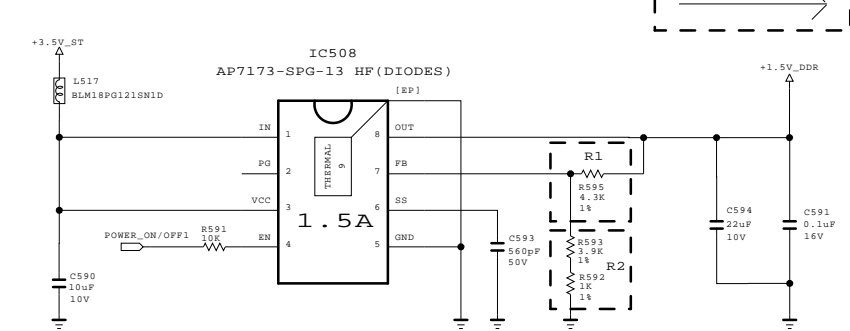
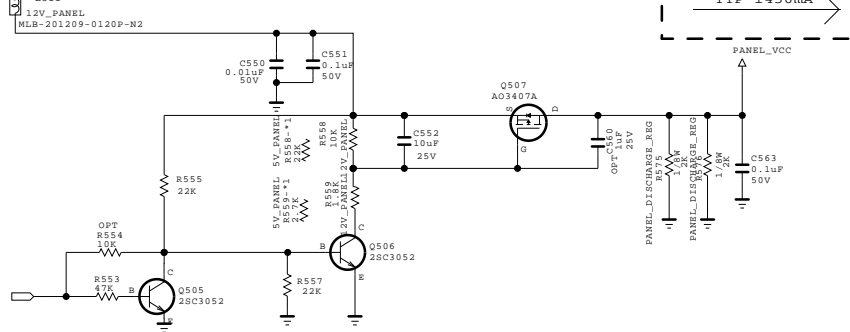
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SECRET

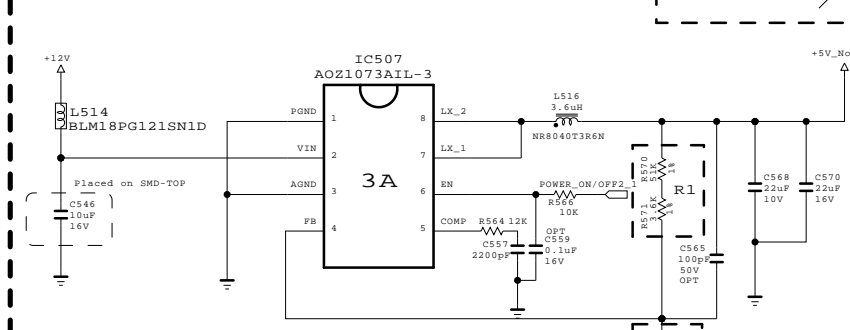
LGElectronics

 LG ELECTRONICS

MODEL	BCM35230	DATE	2010. 09. 18
BLOCK	TUNER SMD GASKET	SHEET	57 / 57

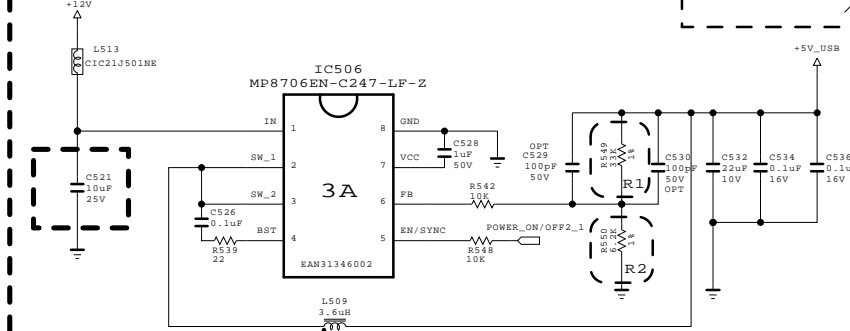
[illegible][illegible][illegible]CHECK PWR/MODULE PIN MAP

$$V_{out} = 0.8 * (1 + R1/R2)$$



$$V_{out} = 0.8 * (1 + R1/R2)$$

Switching freq: 500K



$$V_{out} = (1 + R_1/R_2) * 0.8$$

$$V_{out} = 0.8 * (1 + R1 / R2)$$

MODEL	BCM35230	DATE	
BLOCK	POWER	SHEET	5 / 58



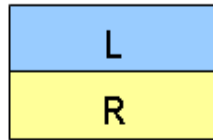
3D Encoding Format

Single Video Stream

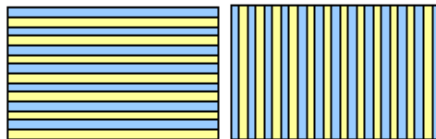
- ☐ Side by Side



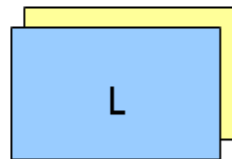
- ☐ Top / Down



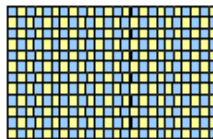
- ☐ Interlaced



- ☐ Frame Sequential



- ☐ Checkerboard

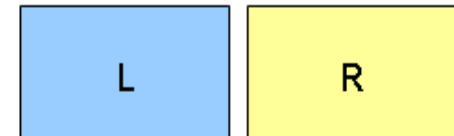


- ☐ Anaglyph

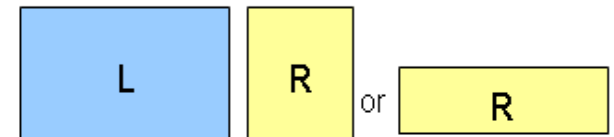


Multiple Video Stream

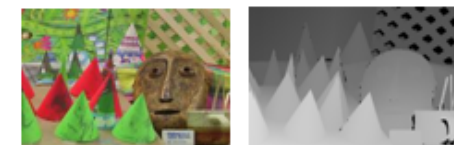
- ☐ Full Left / Right



- ☐ Full Left / Half Right

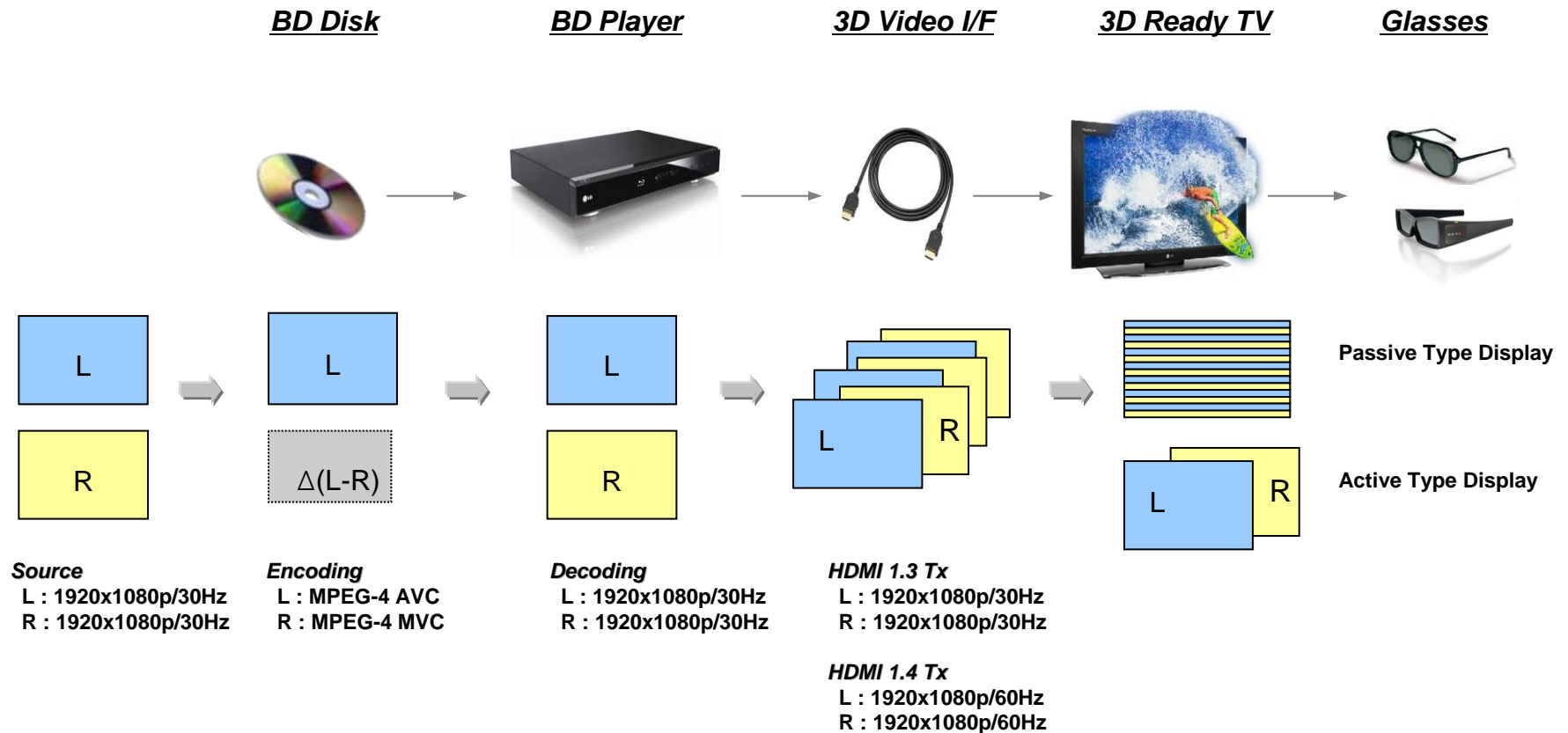


- ☐ 2D Video / Depth



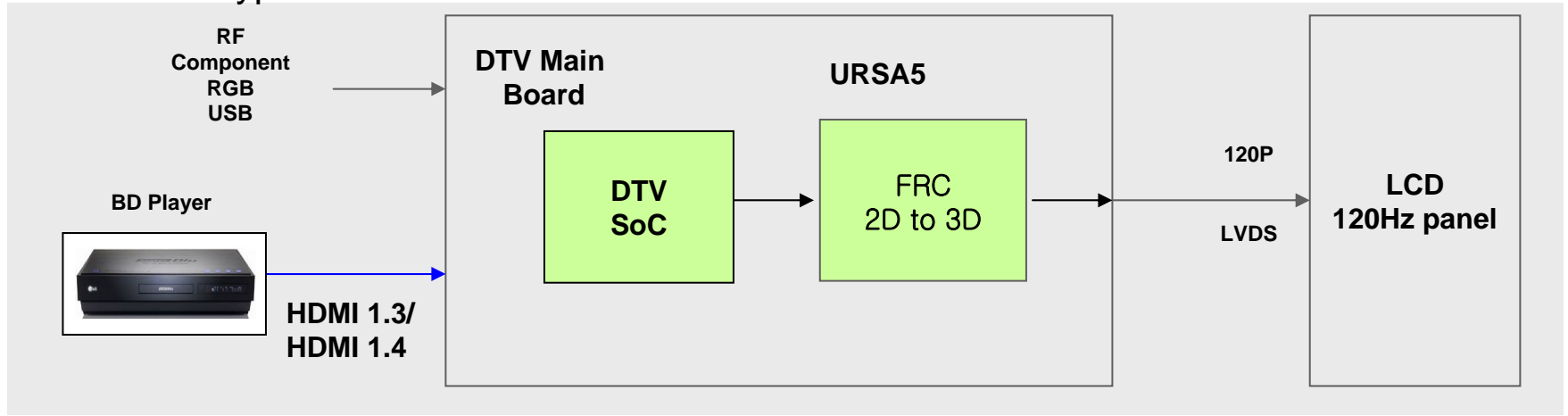
3D Format Processing

Full Resolution Support

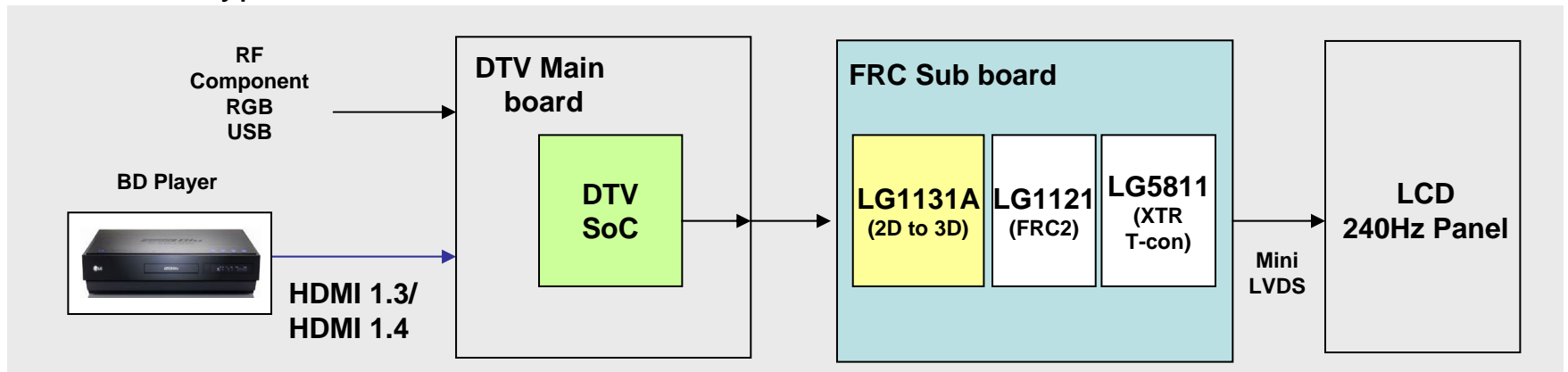


3DTV System

❖ Passive Type

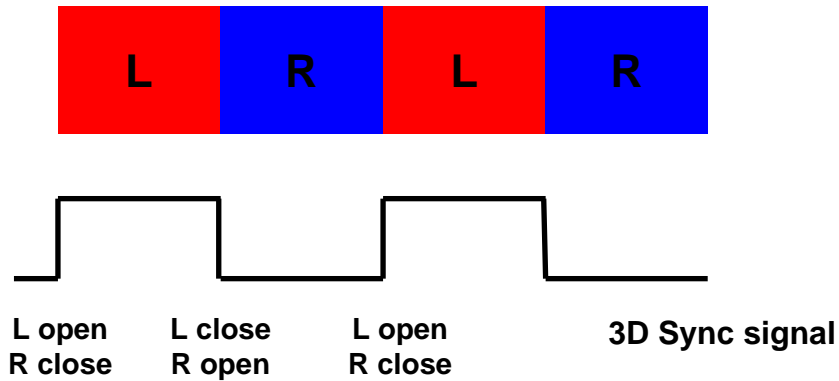


❖ Active Type

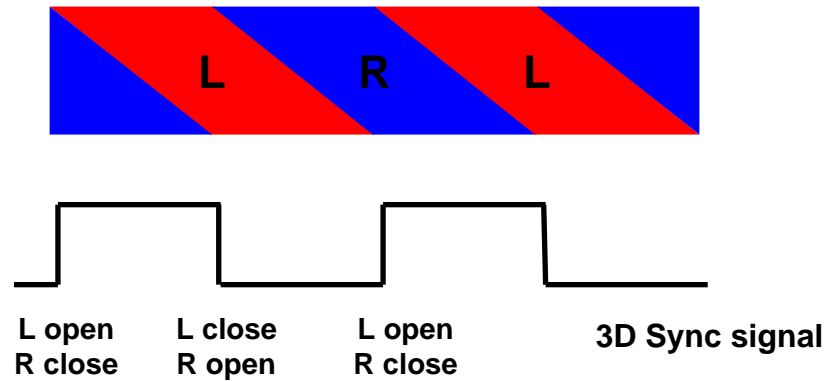


3D with Active glasses

DLP, PDP

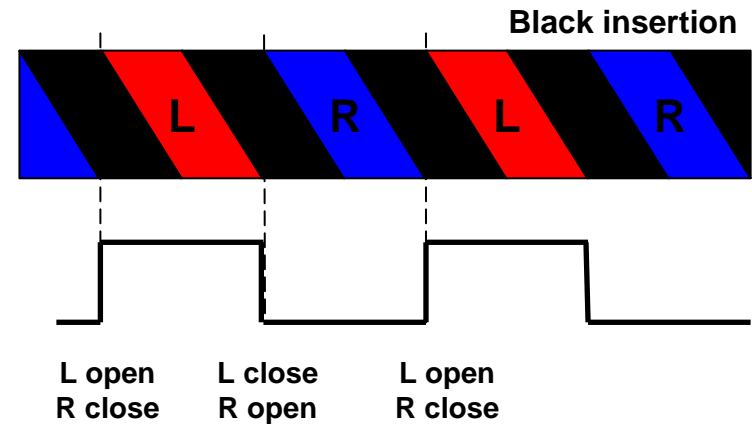
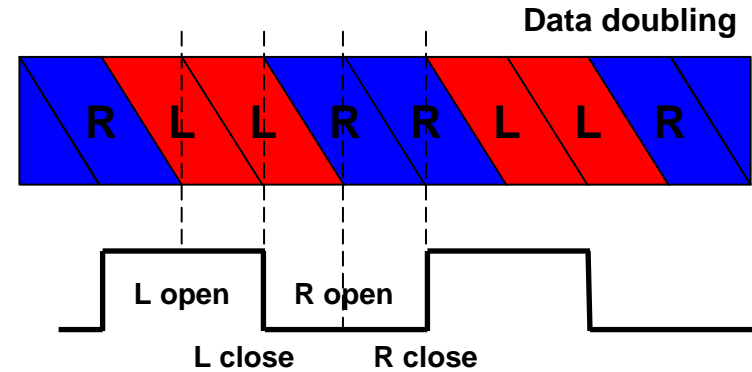


LCD



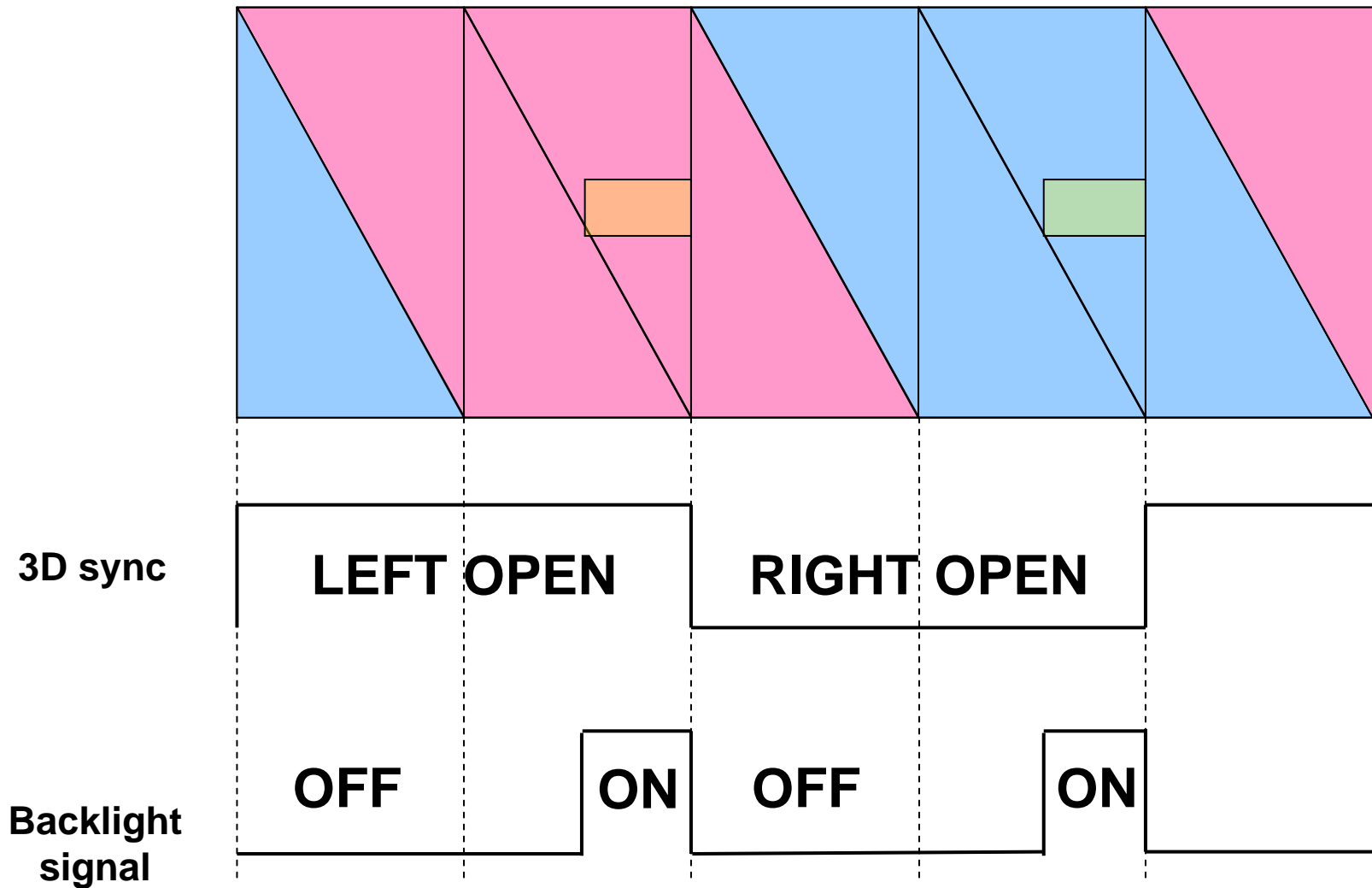
Big Crosstalk because of driving system

Double refresh rate LCD



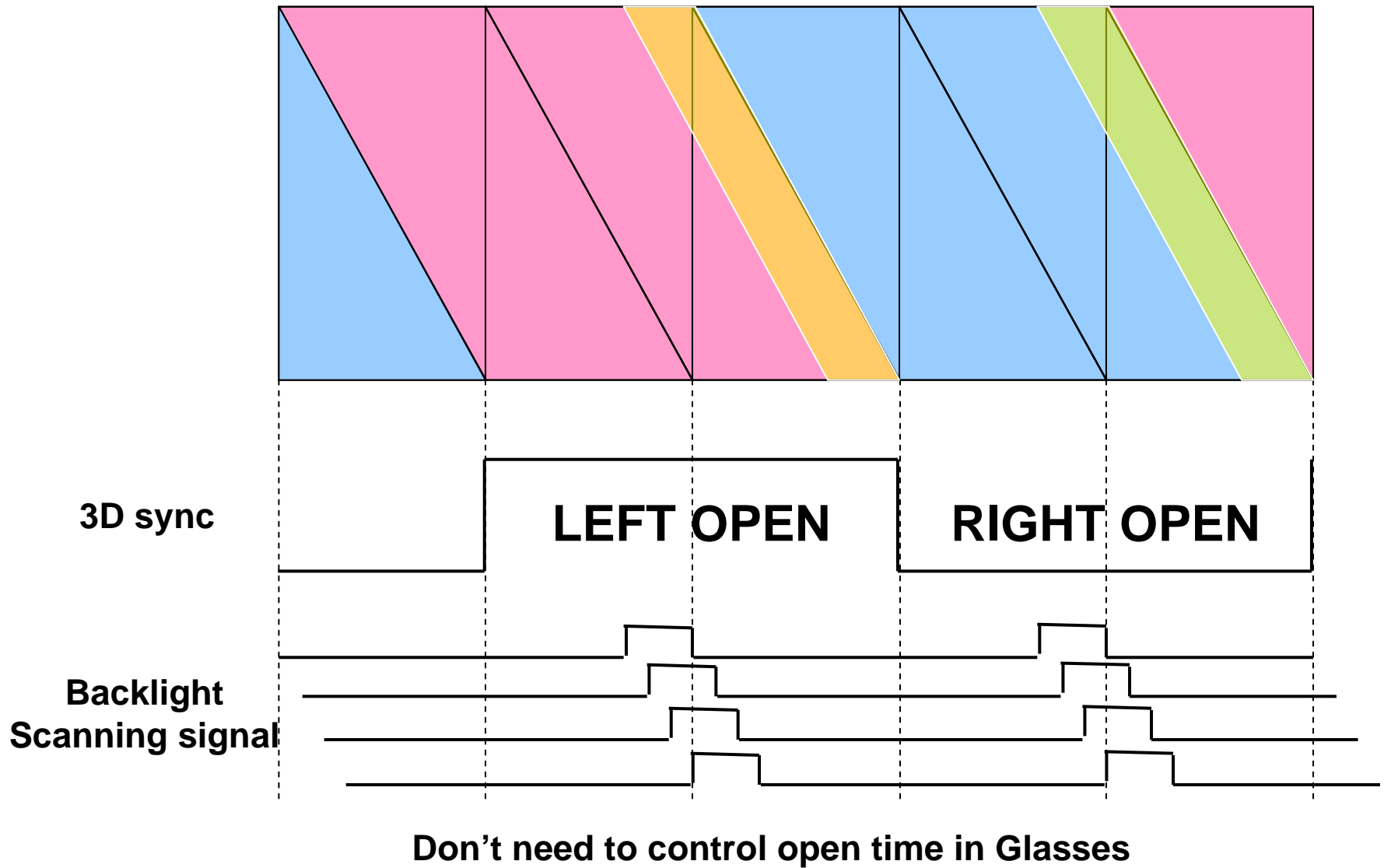
The duration without crosstalk can be made

Backlight blinking and Shutter glasses

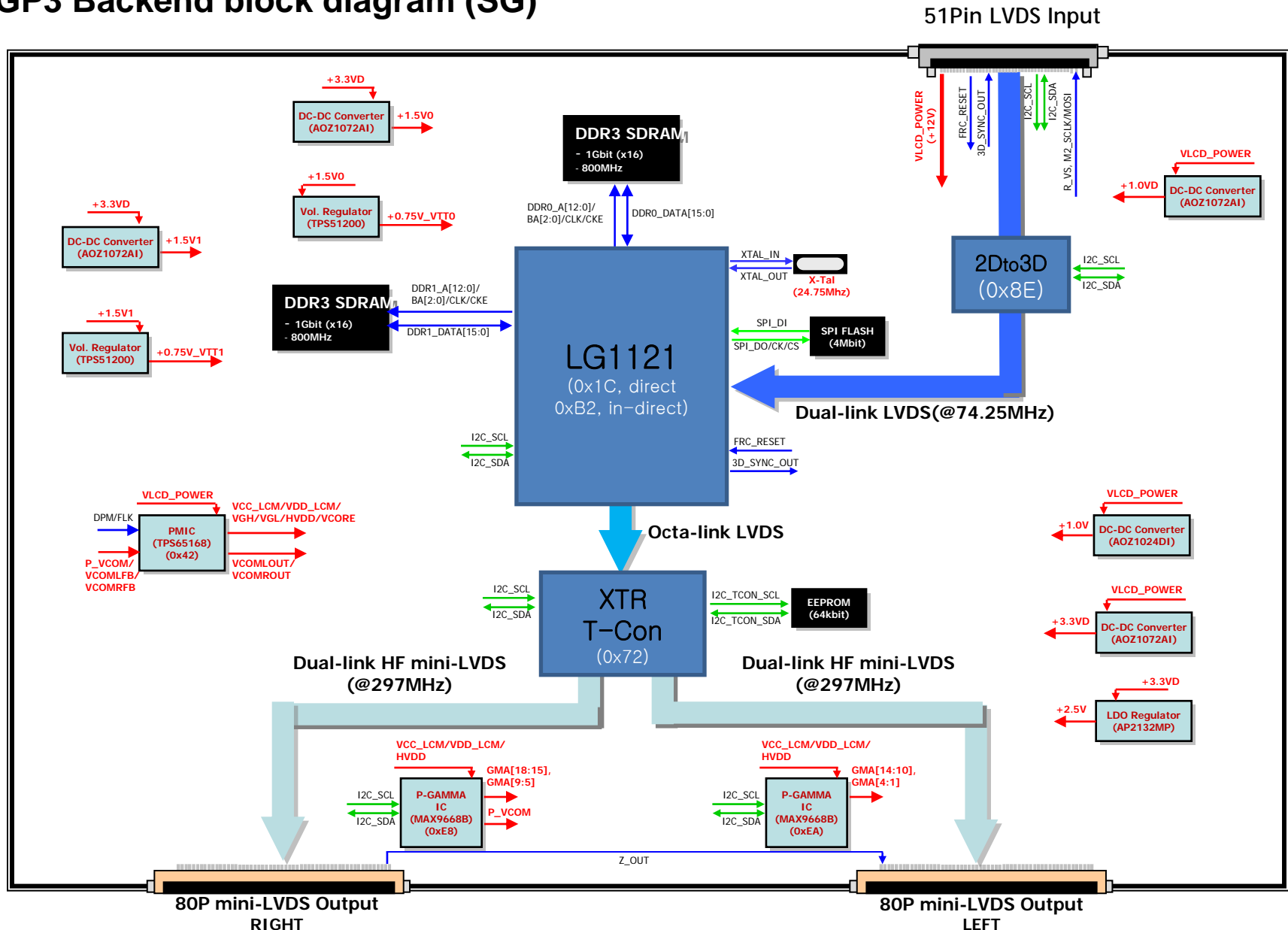


Don't need to control open time in Glasses

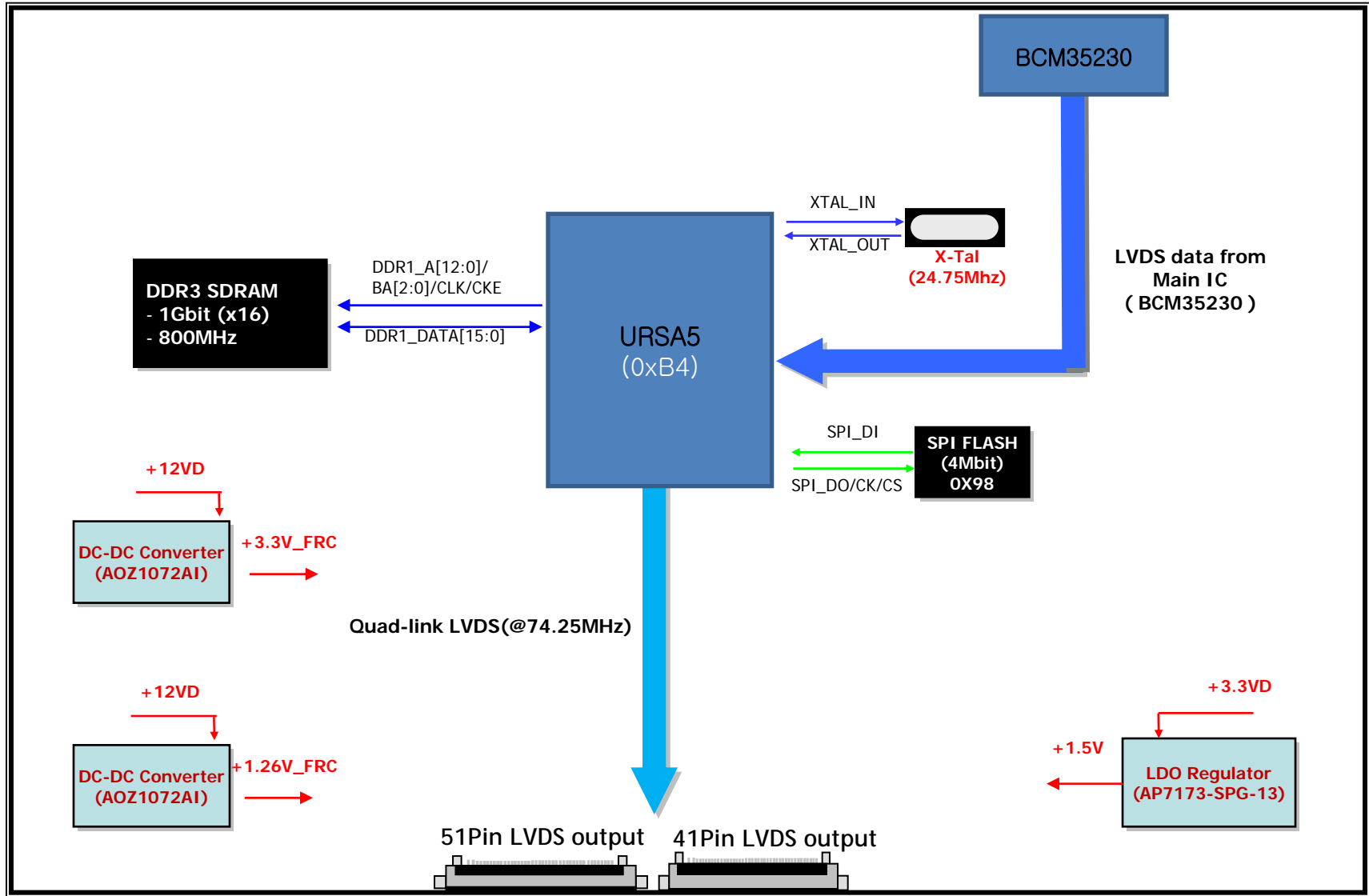
Backlight Scanning and Glasses



GP3 Backend block diagram (SG)



GP3 Backend block diagram (PG)



Repair Guide for BCM Chassis

Model : **LW77/9500-TA, **LW57/6500-TA, **LV5500-TA

Contents

- 0. ALEF & Edge LED, Overview models**
 - 1. Tool Option Information**
 - 2. Area Option Information**
 - 3. Main PCB for BroadBand**
 - 4. Formatter PCB for BroadBand**
 - 5. Block Diagram**
 - 6. Inner Connection**
 - 7. Repair Process (Troubleshooting)**

JAN. 13th, 2011



LG Electronics/ LCD TV

By M.R.VIJAYSHANKAR

LGE Internal Use Only

LED - ALEF

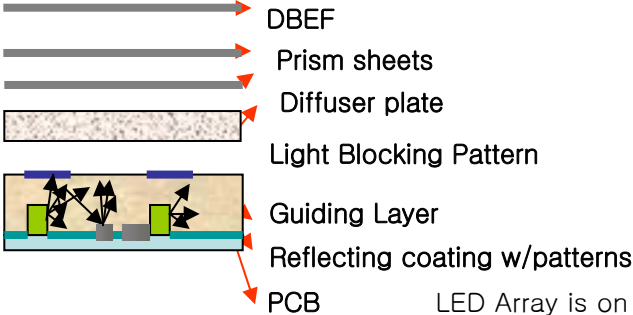
Benefit: More Clear More Real

LED

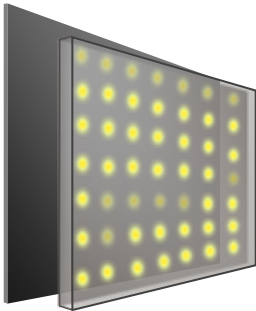


ALEF Type Local Dimming

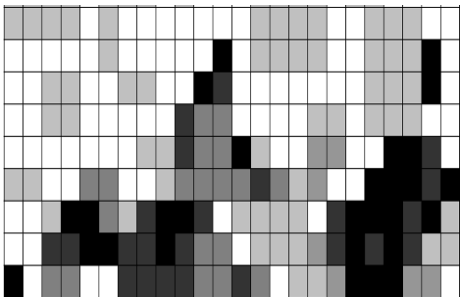
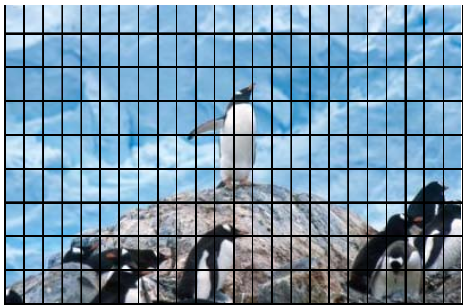
BLU
structure



LED Array is on the back of Module



Local
Dimming



Feature

ALEF LED	Best picture quality + thin TV Slimmer depth better picture quality
Local Dimming	Local dimming depicts more deep black.

Model

XXLW9500-TA

47inch : H(24) * V(10) = 240Block
55inch : H(24) * V(12) = 288Block

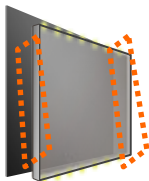
XXLW7700-TA

42inch : H(12) * V(4) = 48Block
47inch : H(12) * V(5) = 60Block
55inch : H(16) * V(6) = 96Block

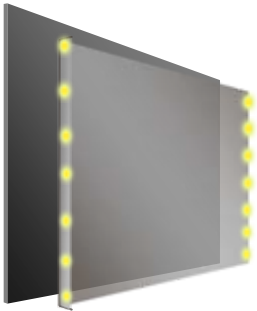
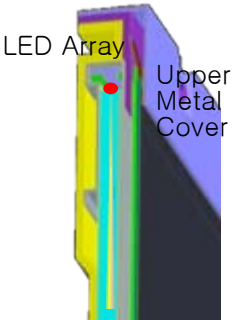
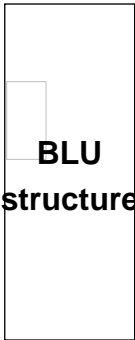
LED - Edge

Benefit: More Clear More Real

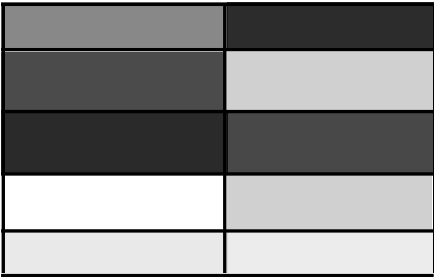
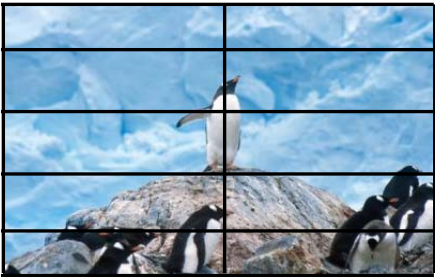
LED



Edge Type w/ Local Dimming



LED Array is on the side of Module



Feature

Edge LED	Best picture quality + thin TV
Local Dimming	Local dimming depicts more deep black.

Model

XXLV5500-TA
XXLW6500-TA
XXLW5700-TA

32inch : H(2) * V(5) = 10Block
37inch : H(2) * V(5) = 10Block
42inch : H(2) * V(8) = 16Block
47inch : H(2) * V(8) = 16Block
55inch : H(2) * V(8) = 16Block

1. Tool Option Information

MODEL	TOOL 1	TOOL 2	TOOL 3	TOOL 4	TOOL 5	TOOL 6	Etc.
47LW9500-TA	33112	4811	3327	35003	47695	696	STD B/L : 65
55LW9500-TA	33115	4811	3327	35003	47695	694	STD B/L : 55
47LW7700-TA	33080	4811	3327	51387	14925	662	STD B/L : 55
55LW7700-TA	33083	4811	3327	51387	14925	8855	STD B/L : 60 PWM : Max_10%

TOOL 1	Setting
Inch	47 / 55
Tool	LW95 / LW77
Maker	LGD
LVDS Bit	10 Bit

TOOL 2	Setting
Video ADC Index	11
Audio ADC Index	11
LocalDim Menu	1
Module Ver.	V6

TOOL 4	Setting
Local Dimming	1
PSU Power	1
Digital Demod	DVB_BCM
Analog Demod	LGT10
Audio Amp.	NTP2AMP
Backlight Ttype	ALEF_LED/ ALEF_LGD

TOOL 3	Setting
EMF(JPEG, MP3)	1
Divx	1
DivX Plus	1
DLNA	1
Digital Eye	1
Headphone	1
Wireless Ready	1
DVR Ready	1
THX	0
THX Media Director	0
Picture Wizard	1
ISF	1
Energy Star	OFF
HDMI Switch IC	SIL
Scart Count	None
Display Port	0

TOOL 5	Setting
WiFi	1
WiFi BuiltIn	1 / 0
Skype	1
Motion Remocon	BuiltIn
Channel Browser	0
Set ID	1
Mirror Mode	0
Orange Service	0
NetCast Service	1
CNETV	0
3D Display Type	3D
2D To 3D	ON
App Store	1
Panel Error Out	OFF
Scanning B/L	ON/OFF

TOOL 6	Setting
STD Backlight	65/55/70/70
USB Count	2
USB Hub Count	1 / 1 / 0 / 0
USB Swap	0
Audio P/W Volt	24V
Speaker Watt.	10W
Max Pwm	Default
3D THX	0

1. Tool Option Information

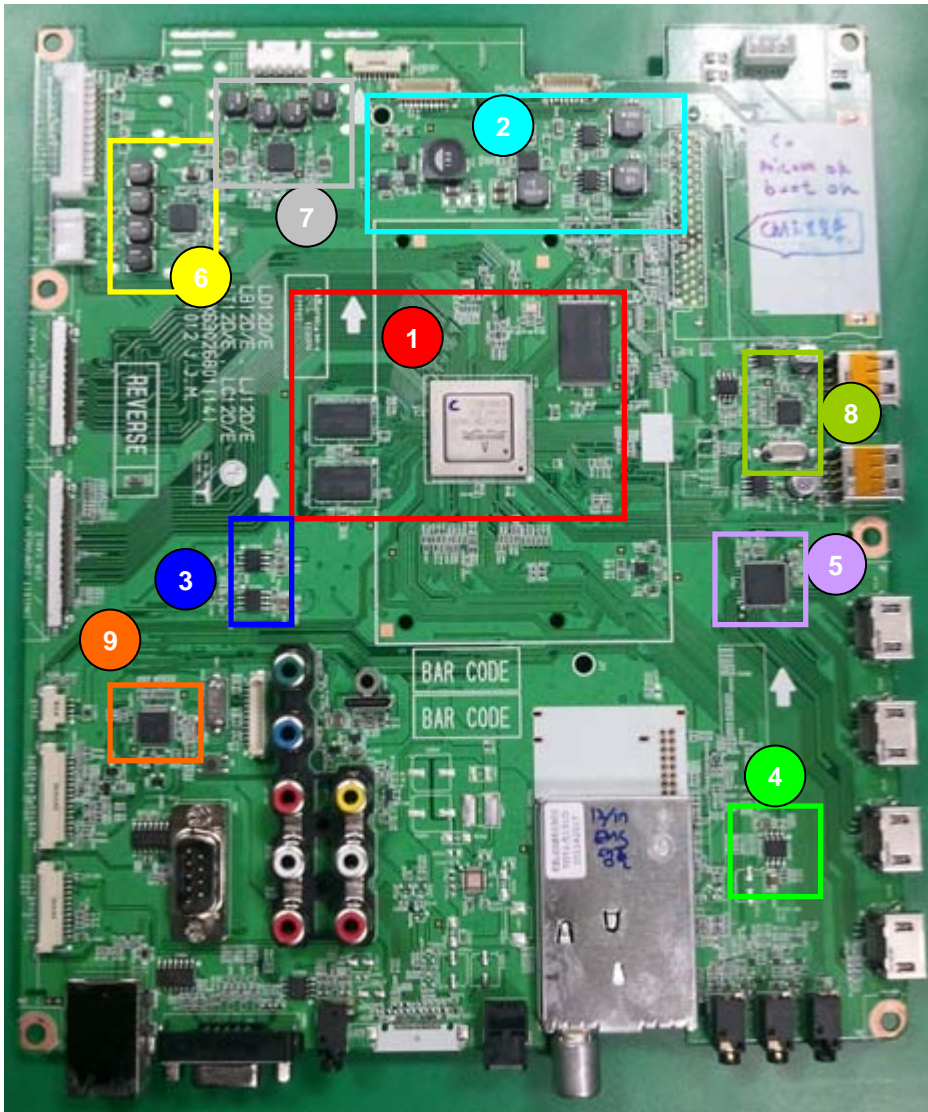
MODEL	TOOL 1	TOOL 2	TOOL 3	TOOL 4	TOOL 5	TOOL 6	Etc.
42LW6500-TA	33030	4811	3327	17593	47701	727	STD B/L : 60
47LW6500-TA	33032	4811	3327	17593	47701	726	STD B/L : 55
55LW6500-TA	33035	4811	3327	17593	47701	727	STD B/L : 60
42LW5700-TA	33190	4811	3327	17593	14933	727	STD B/L : 60
47LW5700-TA	33192	4811	3327	17593	14933	726	STD B/L : 55
32LV5500-TA	32996	715	3327	17594	8789	663	STD B/L : 60
32LV5500-TA (CMI)	35044	715	3327	17594	8917	665	
37LV5500-TA	32997	715	3327	17594	8789	663	
37LV5500-TA (AUO)	37093	715	3327	17594	8917	665	
42LV5500-TA	32998	715	3327	17592	8789	662	STD B/L : 55
42LV5500-TA (AUO)	37094	715	3327	17592	8917	665	
47LV5500-TA	33000	715	3327	17592	8789	663	STD B/L : 60
55LV5500-TA	33003	715	3327	17592	8789	664	STD B/L : 65
55LV5500-TA (AUO)	37099	715	3327	17592	8917	665	

2. Area Option Information

MARKET			Guam(??) KENYA MALAYSIA MAURITIUS South AFRICA West AFRICA SRI LANKA SINGAPORE VIETNAM NIGERIA Myanmar	THAILAND	ALGERI ALGERIA EGYPT JORDAN U.A.E IRAQ(MH/ME _ARABIC) SAUDI ARAB TUNISIE	SUDAN SYRIA	KUWAIT	PAKISTAN	SRI LANKA	INDIA	IRAN IRAQ (MQ_FARSI)	팔레스타인 (English Arab Hebrew 지원)	LEBANON Libya	ISRAEL (H.Y.C, SAKAL) MF, ML	ISRAEL (SBITANY) MT
Area Option		bit수	1060	17444	1444	26020	1448	1456	11300	15396	1572	1412	420	452	388
Default Lang.	0 : ENG 1 : POR 2 : SPA 3 : ---	2	ENG	ENG	ENG	ENG	ENG	ENG	ENG	ENG	ENG	ENG	ENG	ENG	ENG
Wi-Fi Frequency (Wi-Fi 사용/금 지 지역 구분)	0~7	3	1	1	1	1	2	4	1	1	1	1	1	1	1
Lang Gr. (OSD Language Gr. 선택)	0 : ALL 1 : ARAB 2 : HEB 3 : ---	2	ARAB	ARAB	ARAB	ARAB	ARAB	ARAB	ARAB	ARAB	ARAB	ALL	ARAB	HEB	ALL
Teletext Lang	0 : W-EU 1 : E-EU 2 : RUS 3 : ARA 4 : FAR 5 : OFF	3	W_EU	W_EU	ARA	ARA	ARA	ARA	W_EU	W_EU	FAR	ARA	ARA	ARA	ARA
I II Save (User Mono 저장)	0 : OFF 1 : ON	1	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF
HDEV (Audio Overmodulati on)	0 : OFF 1 : ON	1	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
MONO (무조건 Mono 로 처리)	0 : OFF 1 : ON	1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
Location (특정지역 Opt 구분)	0 ~ 7	3	0	2	0	3	0	0	1	1	0	0	0	0	0

3. Main PCB for Broadband

Main Features

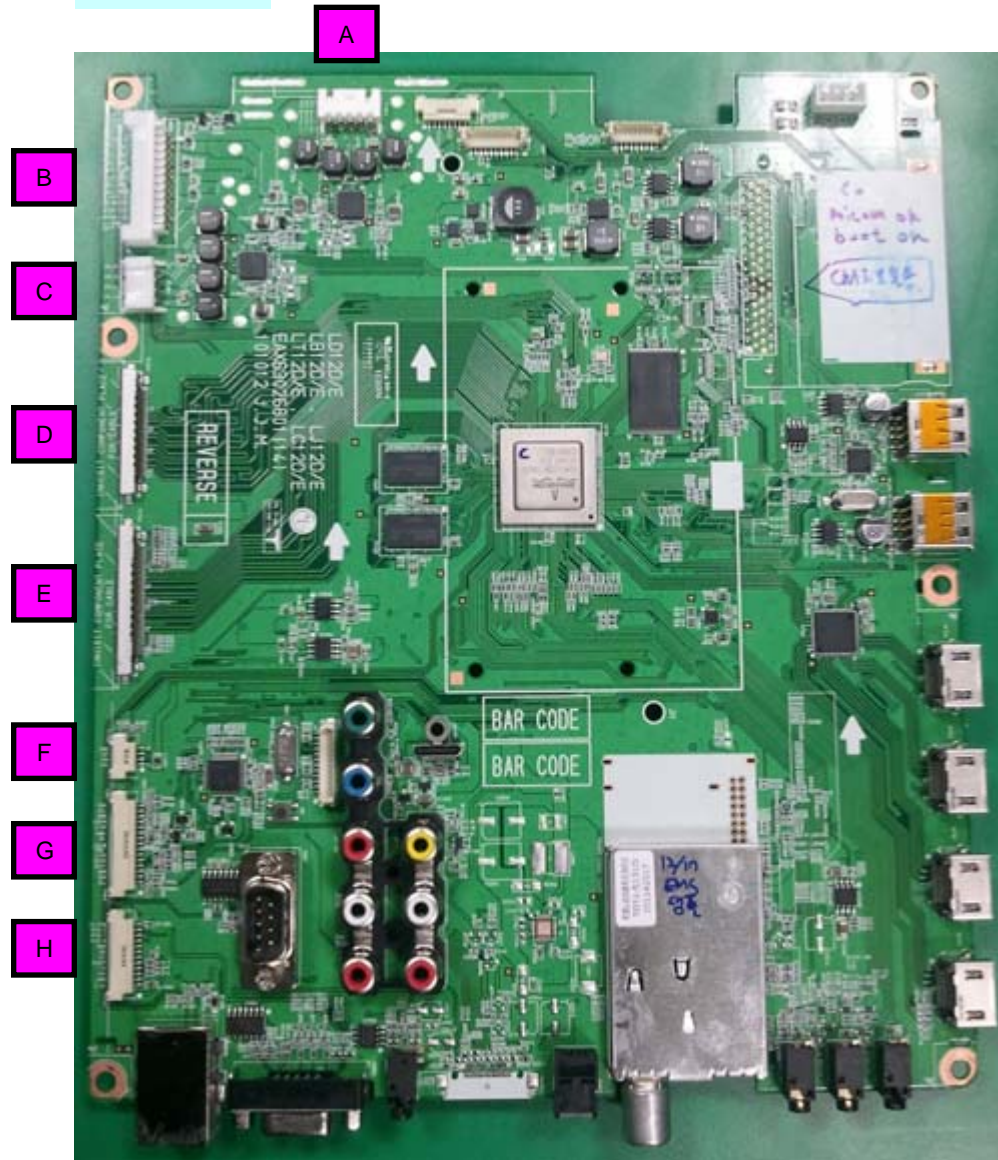


Main Board (LW9500 & LW7700)

- 1 Main processor, DDR Memory, Flash Memory
- 2 Voltage (5V/3.3V/0.9V)
- 3 Voltage (2.5V/1.5V)
- 4 Voltage (1.25V)
- 5 HDMI switch (4:1)
- 6 Audio AMP (Main)
- 7 Audio AMP (Woofer)
- 8 USB switch (2:1)
- 9 NEC MICOM

3. Main PCB for Broadband

Cables

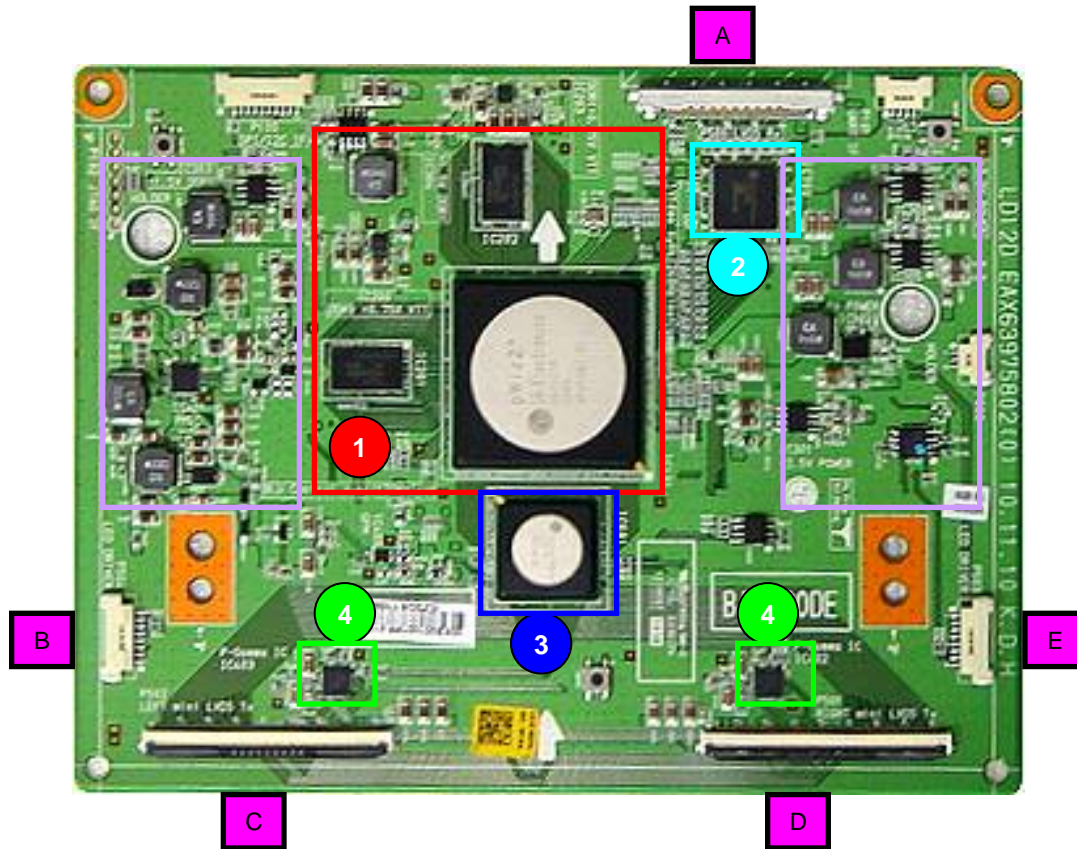


Main Board (LW9500 & LW7700)

- A** To Woofer
- B** To Power Board
- C** To Speaker
- D** Not Use
- E** To Formatter Board
- F** To inner WiFi Assy (Only LW9500)
- G** To IR + Soft Touch Assy
- H** To Motion Remocon Receiver (RF Module)

4. Formatter PCB for Broadband

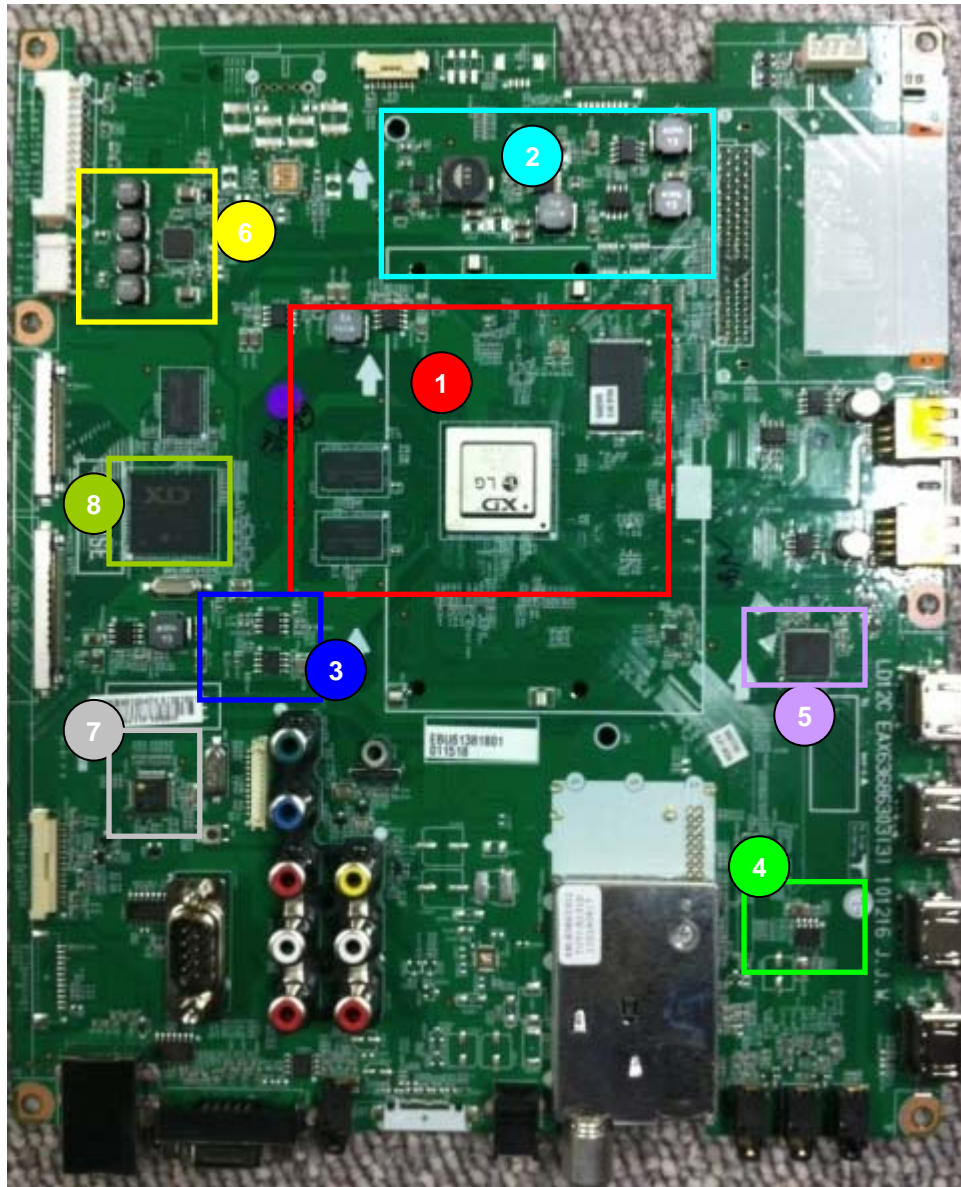
Main Features & Cables (LW9500 & LW7700)



- 1 FRC, DDR Memory
- 2 2D to 3D IC
- 3 XTR IC
- 4 P-GAMMA IC
- 5 VOLTAGE
- A To Main Board (LVDS Cable)
- B To LED Driver Board (Master)
- C To LCD Module (LVDS 240Hz Cable)
- D To LCD Module (LVDS 240Hz Cable)
- E To LED Driver Board (Slave)

3. Main PCB for Broadband

Main Features



Main Board (LW6500 & LW5700)

- 1 Main processor, DDR Memory, Flash Memory
- 2 Voltage (5V/3.3V/0.9V)
- 3 Voltage (2.5V/1.5V)
- 4 Voltage (1.25V)
- 5 HDMI switch (4:1)
- 6 Audio AMP (Main)
- 7 NEC MICOM
- 8 URSA5 EXTERNAL FRC

3. Main PCB for Broadband

Cables

A



Main Board (LW6500 & LW5700)

A

To Power Board (Local Dimming)

B

To Power Board

C

To Speaker

D

To Module 41P

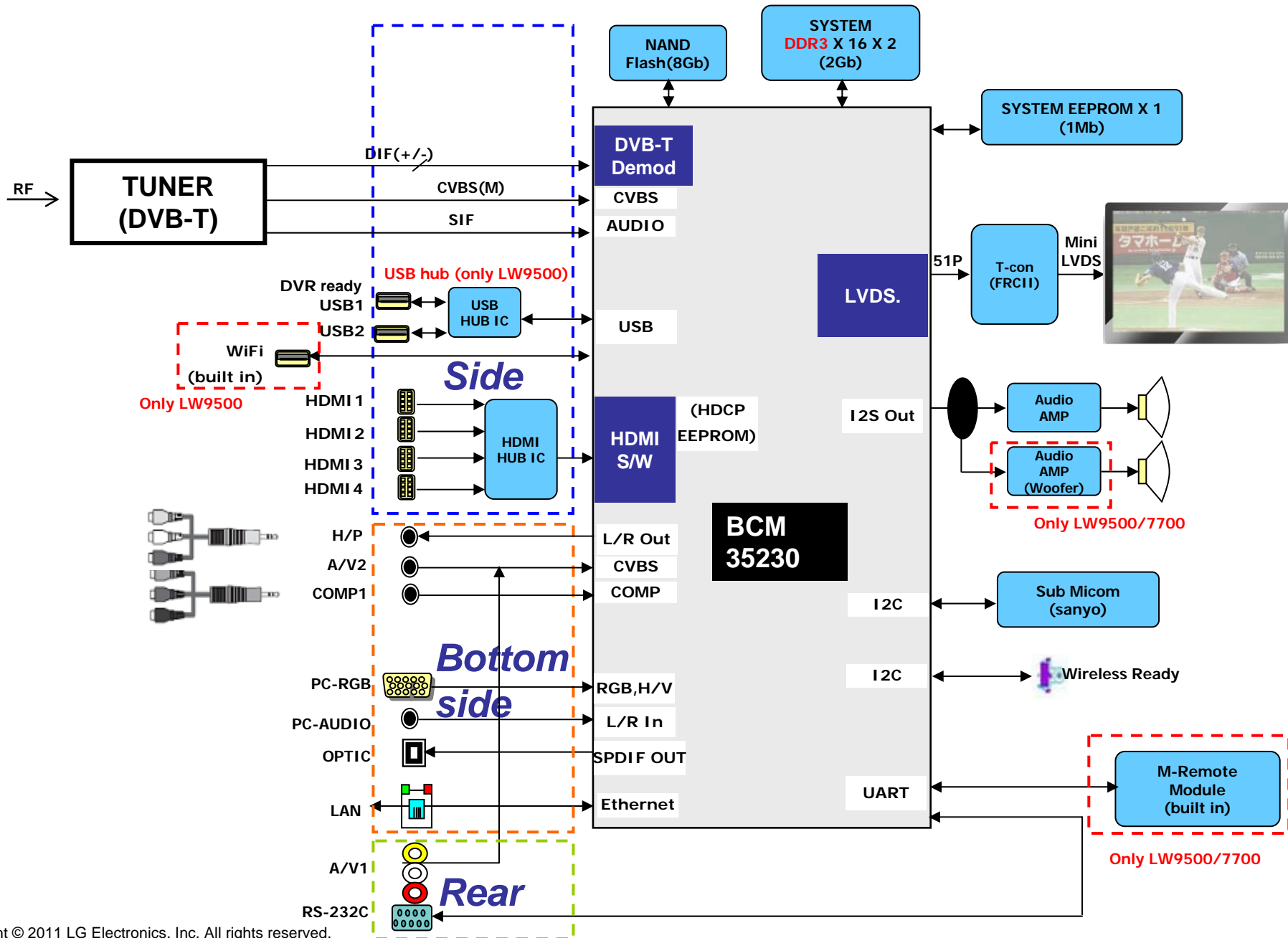
E

To Module 51P

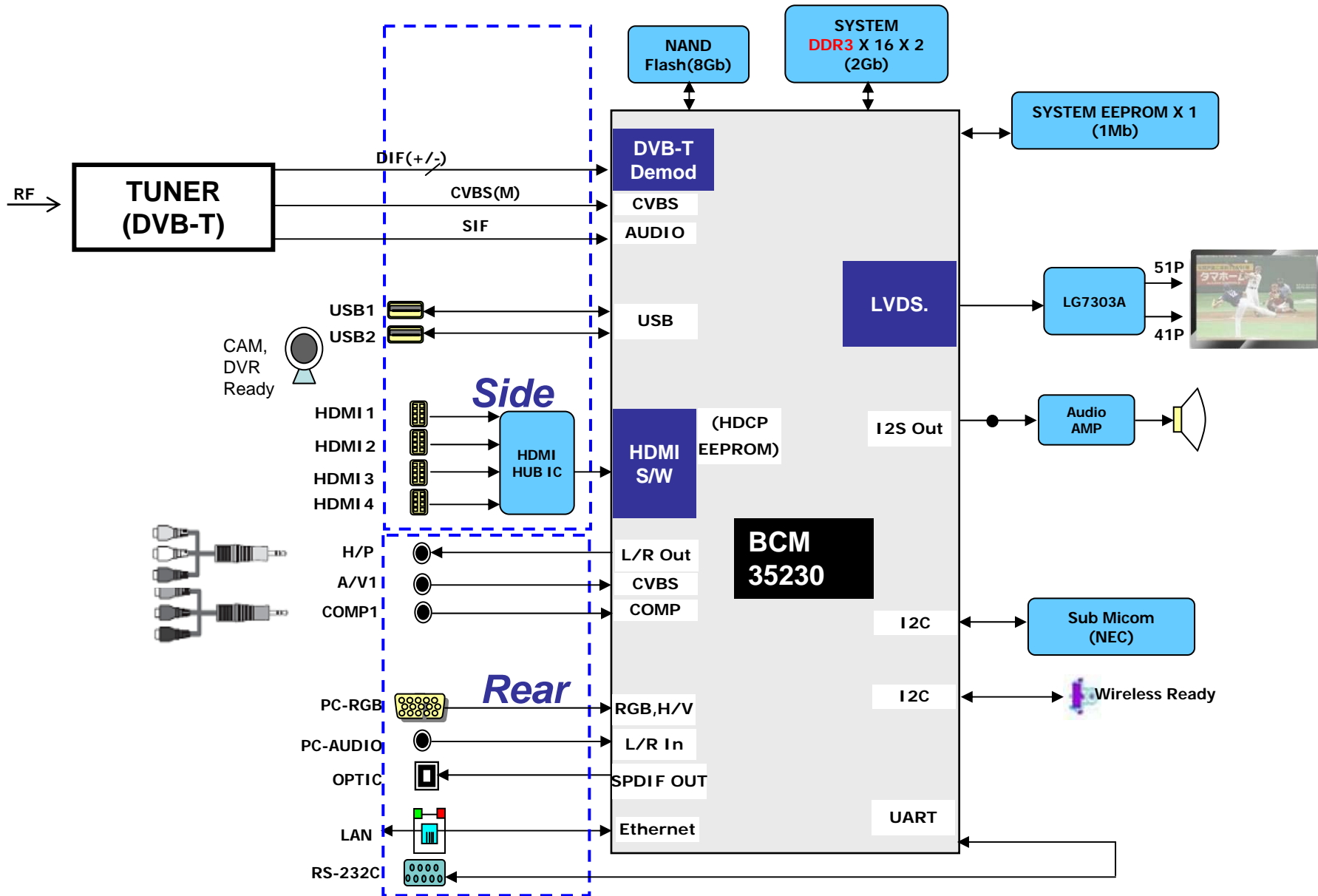
F

To IR + Soft Touch Assy

5. Block Diagram (SG LW95/77, LV55)

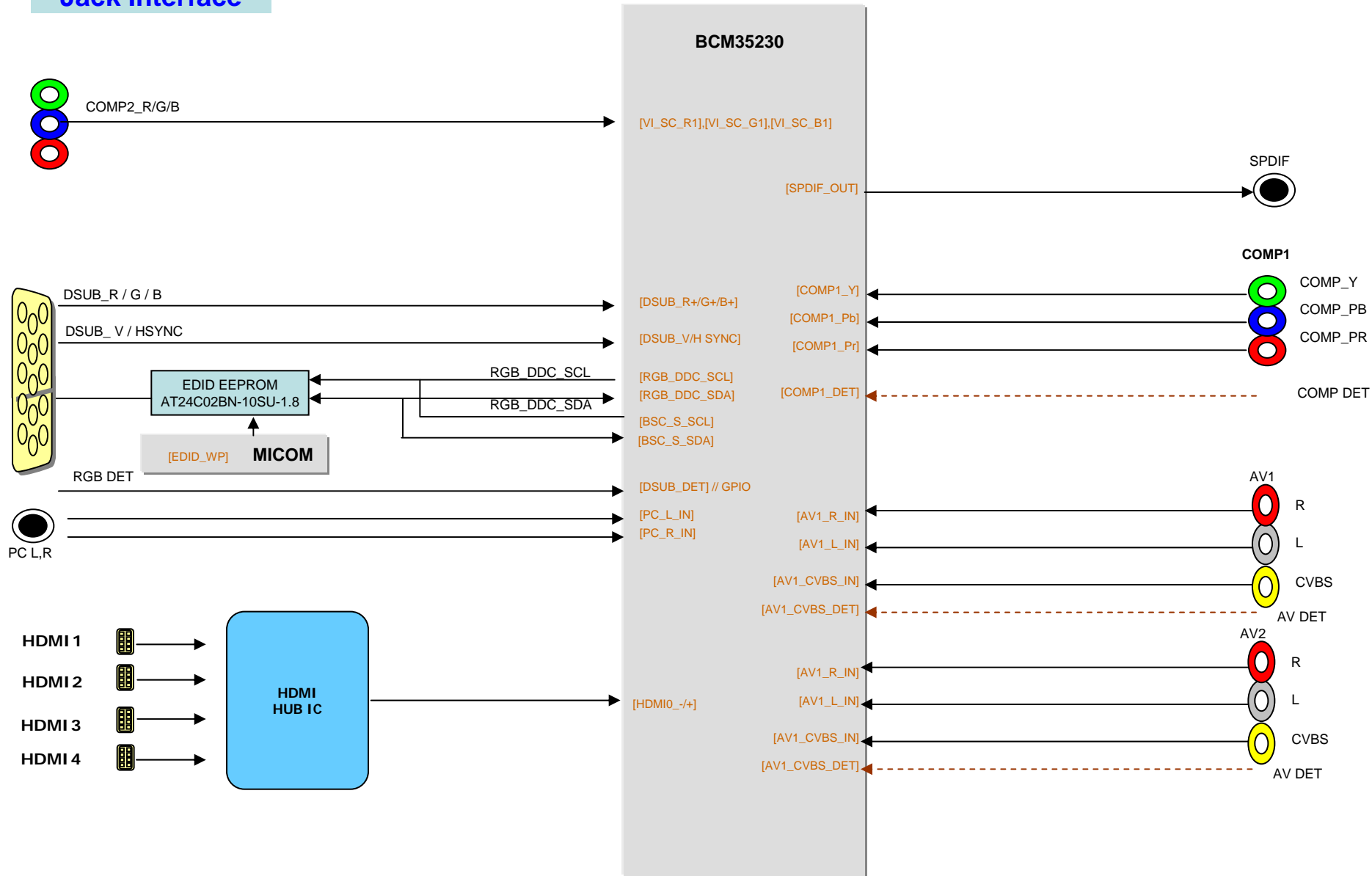


5. Block Diagram (LW65/57)



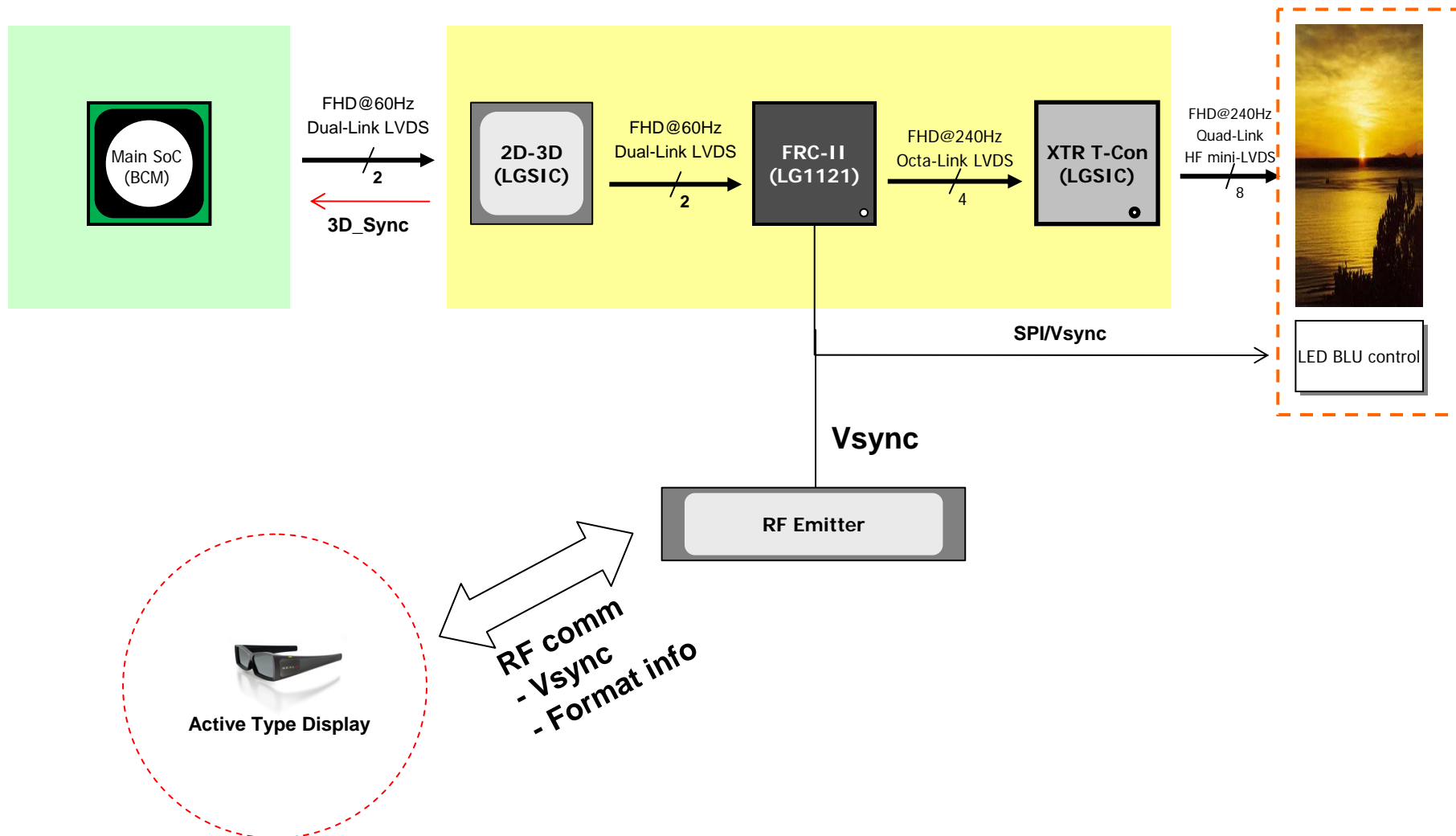
5. Block Diagram

Jack Interface



Appendix. Block Diagram for Edge/ALEF Backlight

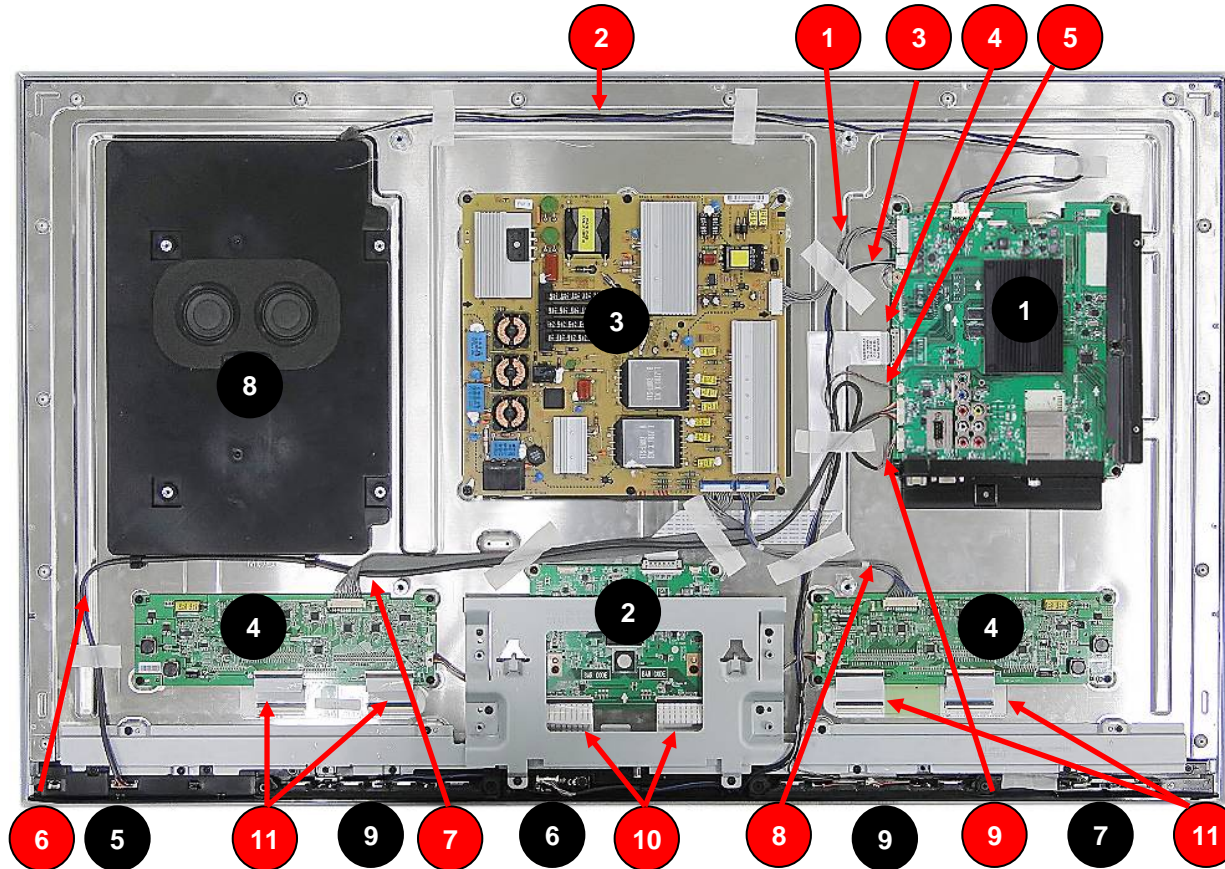
[All in one main PCB for [XXLW950T/W/S/G](#), [XXLW770T/W/S/G](#) ALEF LED Backlight]



*** For more information about 3D system, refer to the page 1 ~6**

6. Interconnection - 1

47/55LW9500



[PCBs]

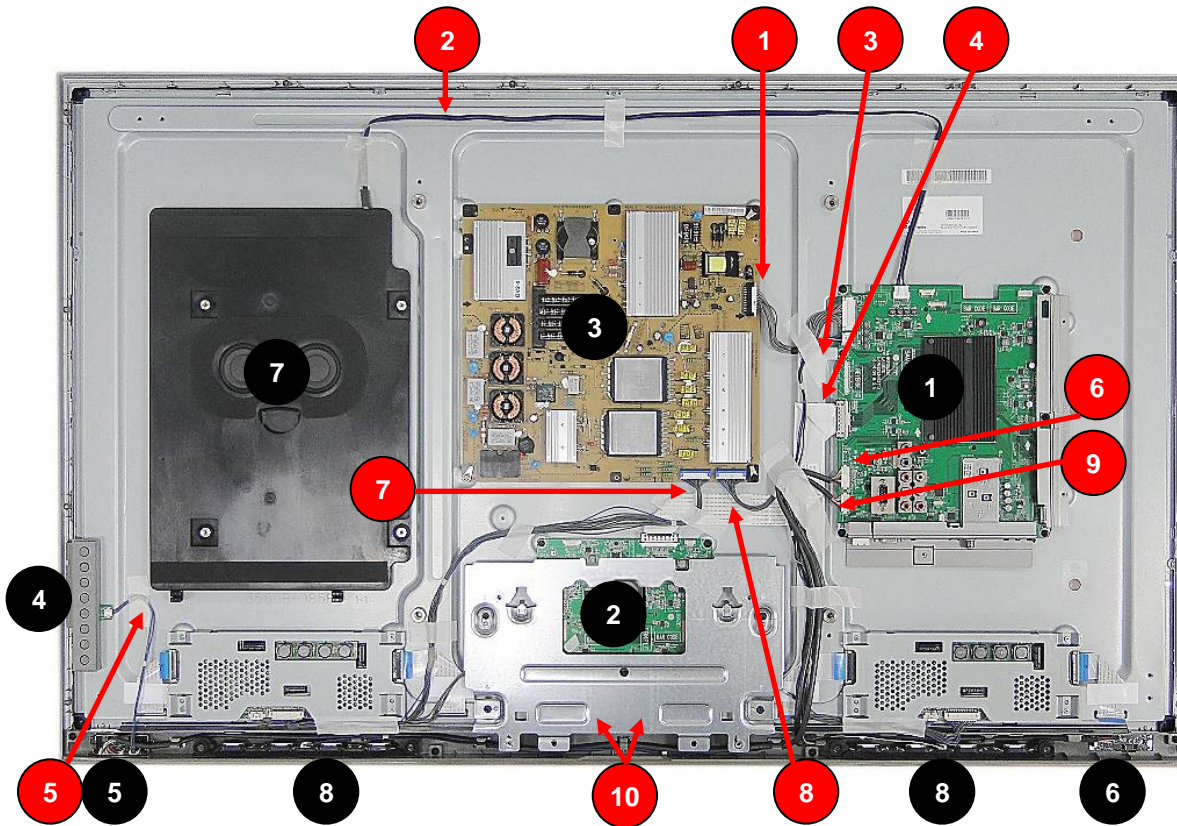
- 1** Main PCB
- 2** Formatter PCB
- 3** PSU
- 4** LED Driver
- 5** Soft Touch + IR
- 6** Motion Receiver (RF Module)
- 7** WiFi
- 8** Woofer
- 9** Speaker

[Cables]

- | | | |
|------------------------------|--------------------------------|--|
| 1 Main to PSU | 4 Main to Formatter | 8 Power to LED Driver |
| 2 Main to Woofer | 5 Main to WiFi | 9 Main to Motion Receiver (RF Module) |
| 3 Main to Speaker | 6 Main to IR+Soft Touch | 10 Formatter to LCD Module |
| 7 Power to LED Driver | | 11 LED Driver to LCD Module |

6. Interconnection - 2

47/55LW7700



[PCBs]

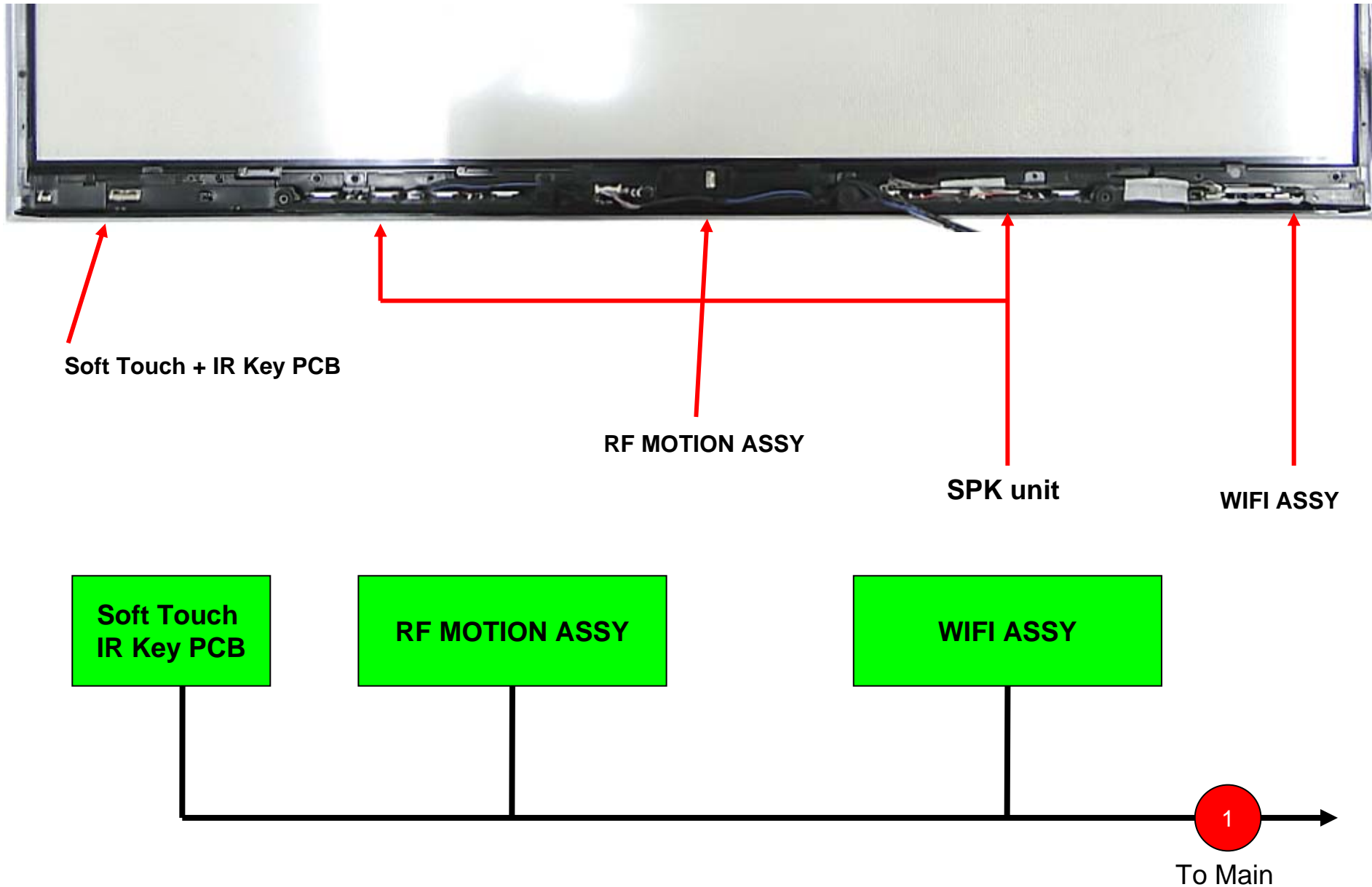
- 1 Main PCB
- 2 Formatter PCB
- 3 PSU
- 4 Control Button
- 5 IR
- 6 Motion Receiver (RF Module)
- 7 Woofer
- 8 Speaker

[Cables]

- | | | |
|-------------------|--------------------------|---------------------------------------|
| 1 Main to PSU | 4 Main to Formatter | 8 Power to LED Driver |
| 2 Main to Woofer | 5 Main to Control Button | 9 Main to Motion Receiver (RF Module) |
| 3 Main to Speaker | 6 Main to IR | 10 Formatter to LCD Module |
| | 7 Power to LED Driver | |

6. Interconnection –1 sub PCB

47/55LW9500



6. Interconnection –2 sub PCB

47/55LW7700



IR PCB

Control Key PCB

SPK unit

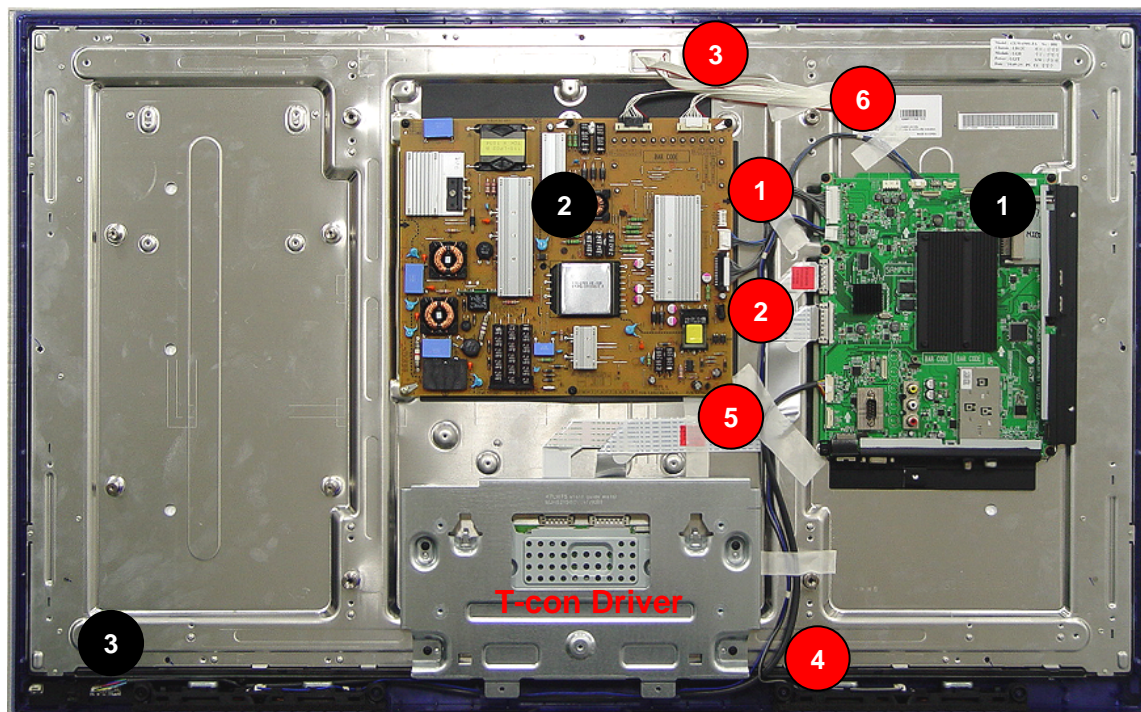
RF MOTION ASSY



To Main

6. Interconnection - 3

XXLW6500-TA
XXLW5700-TA



[PCBs]

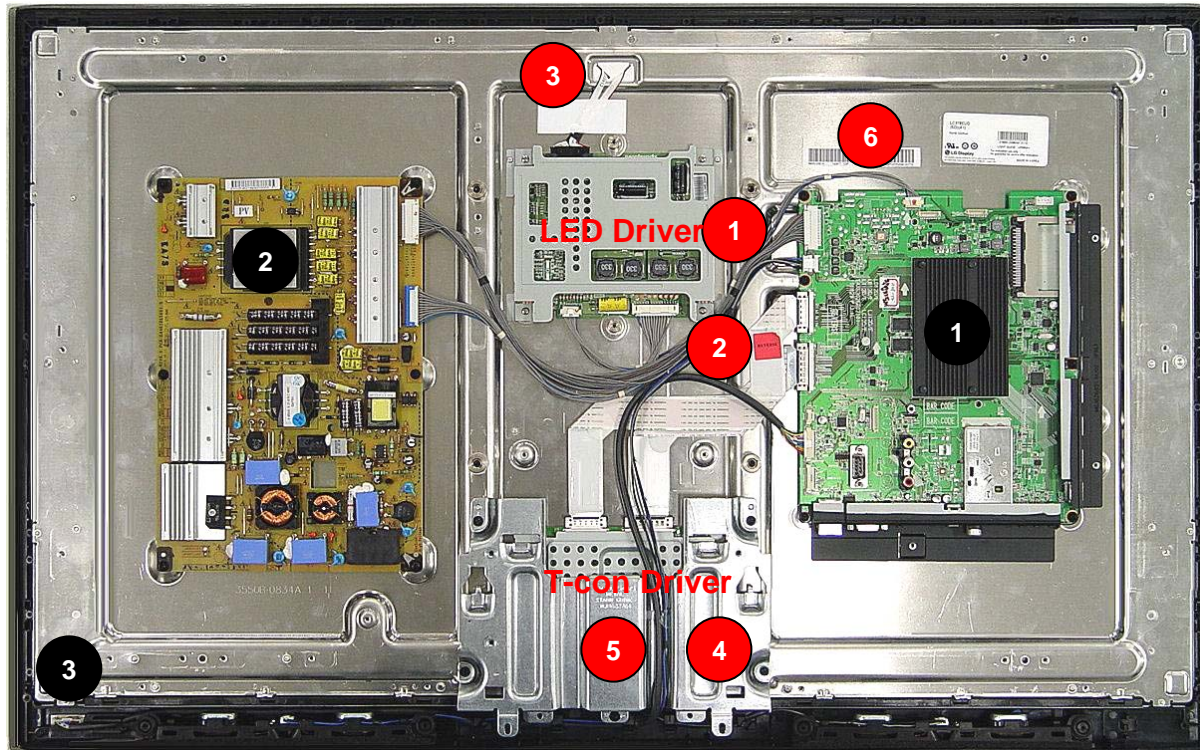
- 1 Main PCB
- 2 Power Board
- 3 Soft touch + IR Key PCB

[Cables]

- 1 Main / PSU cable
- 2 Main / Module LVDS cable
41&51PIN
- 3 LED driver / PSU
- 4 15Pin (IR+Touch) Cable
- 5 SPK Cable
- 6 Local Dimming Cable

6.Interconnection - 4

32/37LV5500-TA



[PCBs]

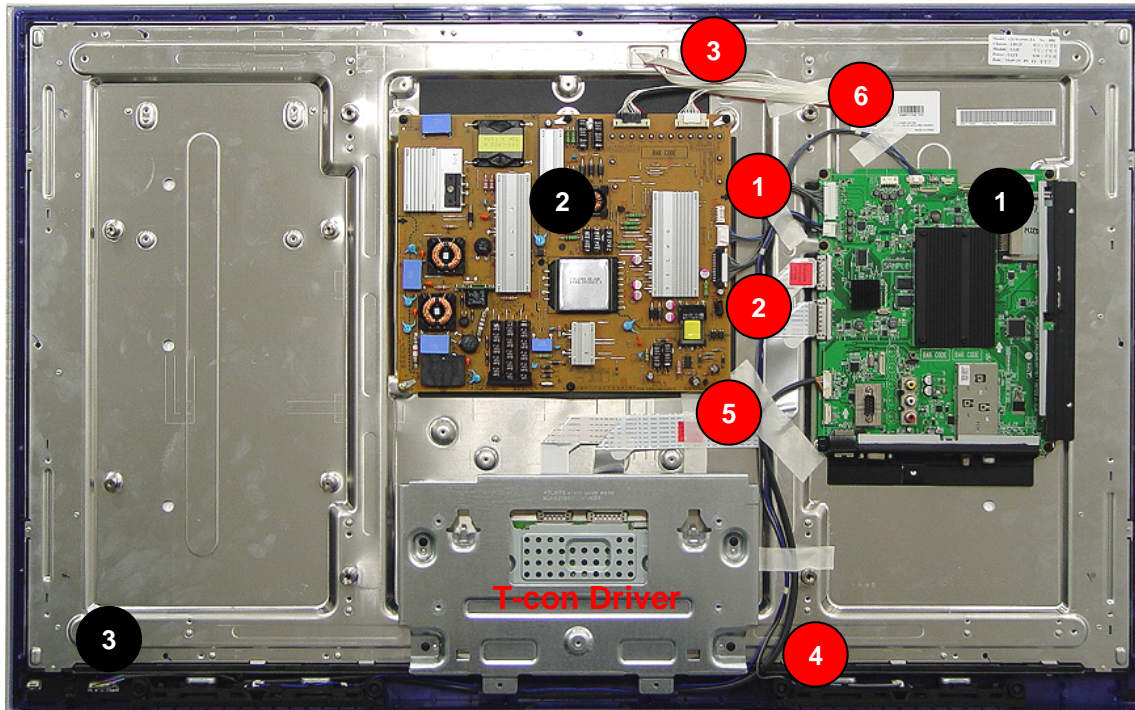
- 1 Main PCB
- 2 Power Board
- 3 Soft touch + IR Key PCB (LW570 only IR Assy)

[Cables]

- 1 Main / PSU cable
- 2 Main / Module LVDS cable 41&51PIN
- 3 LED driver / PSU
- 4 15Pin (IR+Touch) Cable
- 5 SPK Cable
- 6 Local Dimming Cable

6. Interconnection - 5

42/47LV5500-TA



[PCBs]

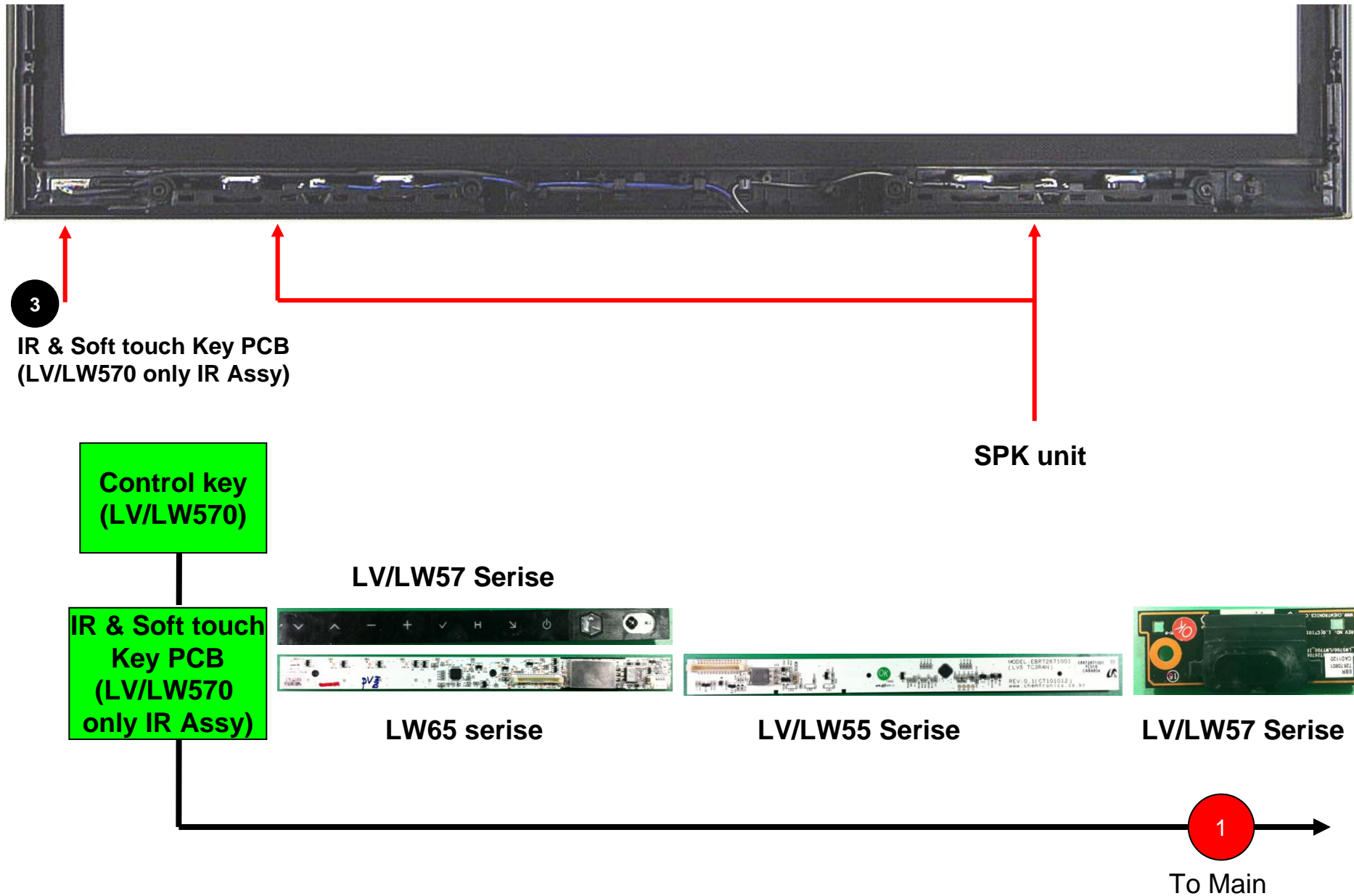
- 1 Main PCB
- 2 Power Board
- 3 Soft touch + IR Key PCB (LV570 only IR Assy)

[Cables]

- 1 Main / PSU cable
- 2 Main / Module LVDS cable 41&51PIN
- 3 LED driver / PSU
- 4 15Pin (IR+Touch) Cable
- 5 SPK Cable
- 6 Local Dimming Cable

**Same interconnection LW or LV serie
in the 42"/47"**

Interconnection – sub PCB(LV/LW55/57/65 serie)



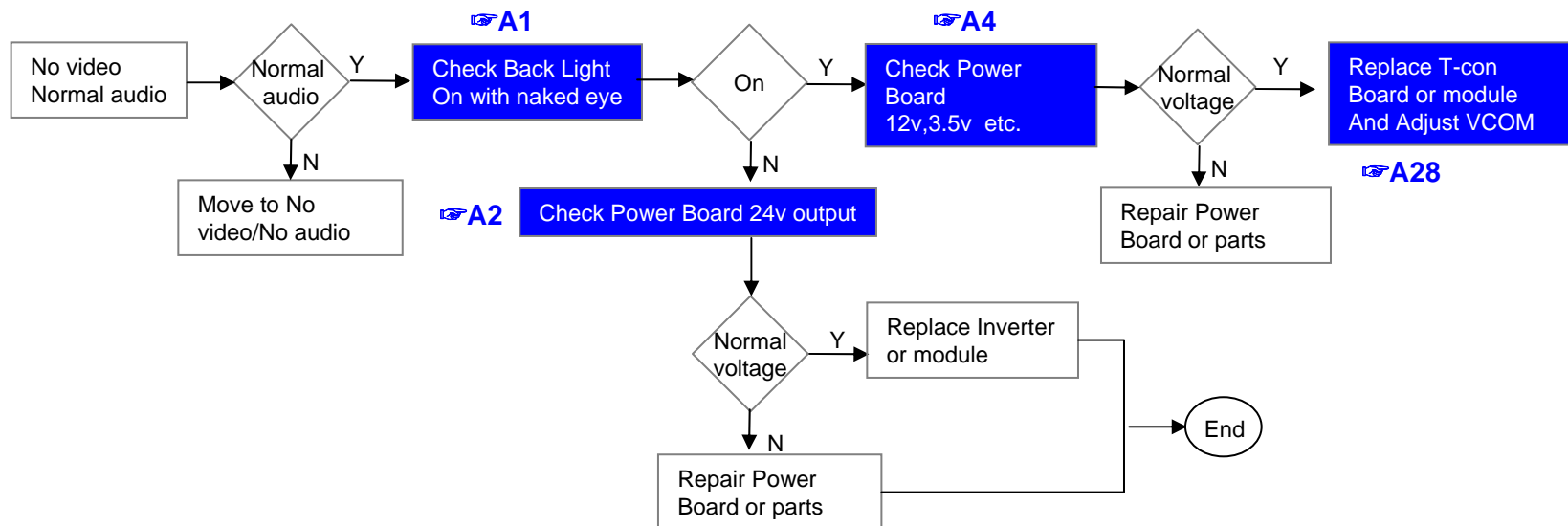
Contents of LCD TV Standard Repair Process

No.	Error symptom (High category)	Error symptom (Mid category)	Page	Remarks
1	A. Video error	No video/Normal audio	1	
2		No video/No audio	2	
3		Video error, video lag/stop, fail tuning	3, 4	
4		Color error	5	
5		Vertical/Horizontal bar, residual image, light spot, external device color error	6	
6	B. Power error	No power	7	
7		Off when on, off while viewing, power auto on/off	8	
8	C. Audio error	No audio/Normal video	9	
9		Wrecked audio/discontinuation/noise	10	
10	D. Function error	No response in remote controller, key error, recording error, memory error	11	
11		External device recognition error	12	
12	E. Noise	Circuit noise, mechanical noise	13	
13	F. Exterior error	Exterior defect	14	

First of all, Check whether there is SVC Bulletin in GCSC System for these model.

LCD TV	Error symptom	A. Video error	Established date	2010. 12 .14	1/14
		No video/ Normal audio	Revised date		

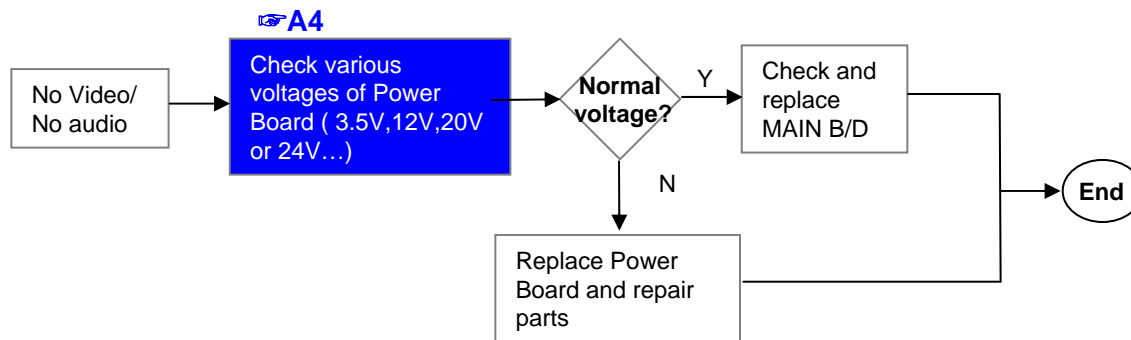
First of all, Check whether all of cables between board is inserted properly or not.
(Main B/D↔ Power B/D, LVDS Cable,Speaker Cable,IR B/D Cable,,,)



※Precaution A7 & A3



LCD TV	Error symptom	A. Video error	Established date	2010. 12 .14	
		No video/ No audio	Revised date		2/14

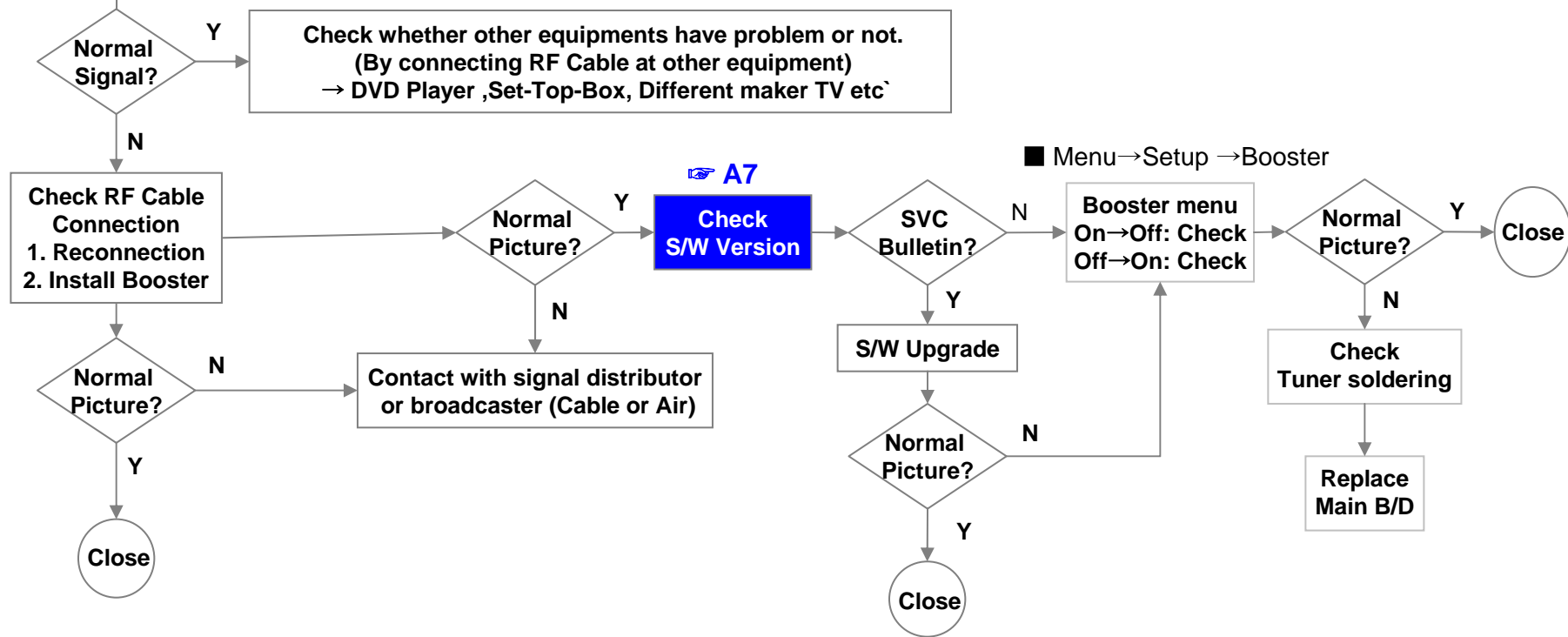


LCD TV	Error symptom	A. Picture Problem	Established date	2010. 12 .14	
		Picture broken/ Freezing	Revised date		3/14

👉 A6

Check RF Signal level

- . By using Digital signal level meter
- . By using Diagnostics menu on OSD
(Menu → Set up → Support → Signal Test)
- Signal strength (Normal : over 50%)
- Signal Quality (Normal: over 50%)

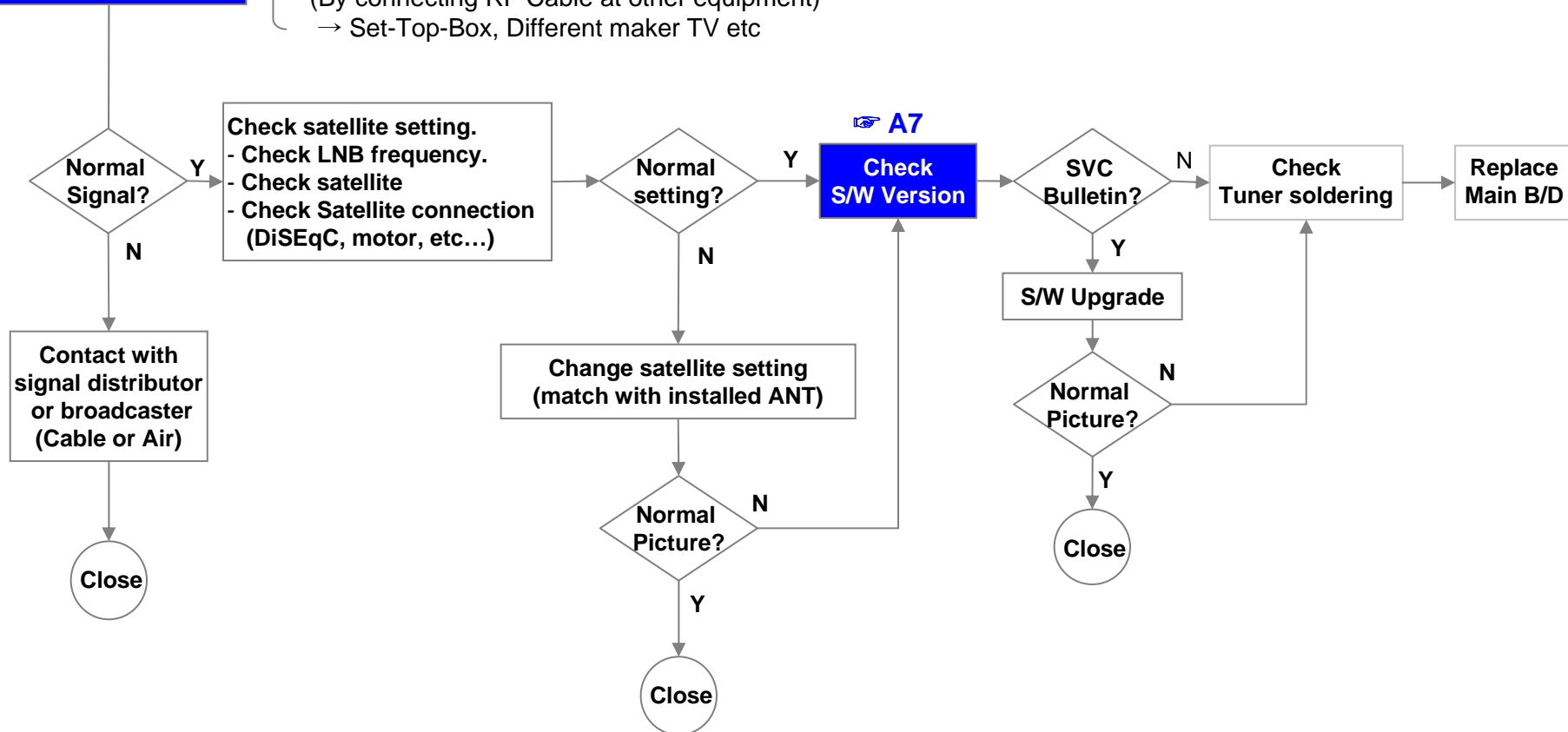


LCD TV	Error symptom	A. Picture Problem (DVB-S/S2)	Established date	2011. 01 .24	
		Tuning fail, Picture broken/ Freezing	Revised date		4/14

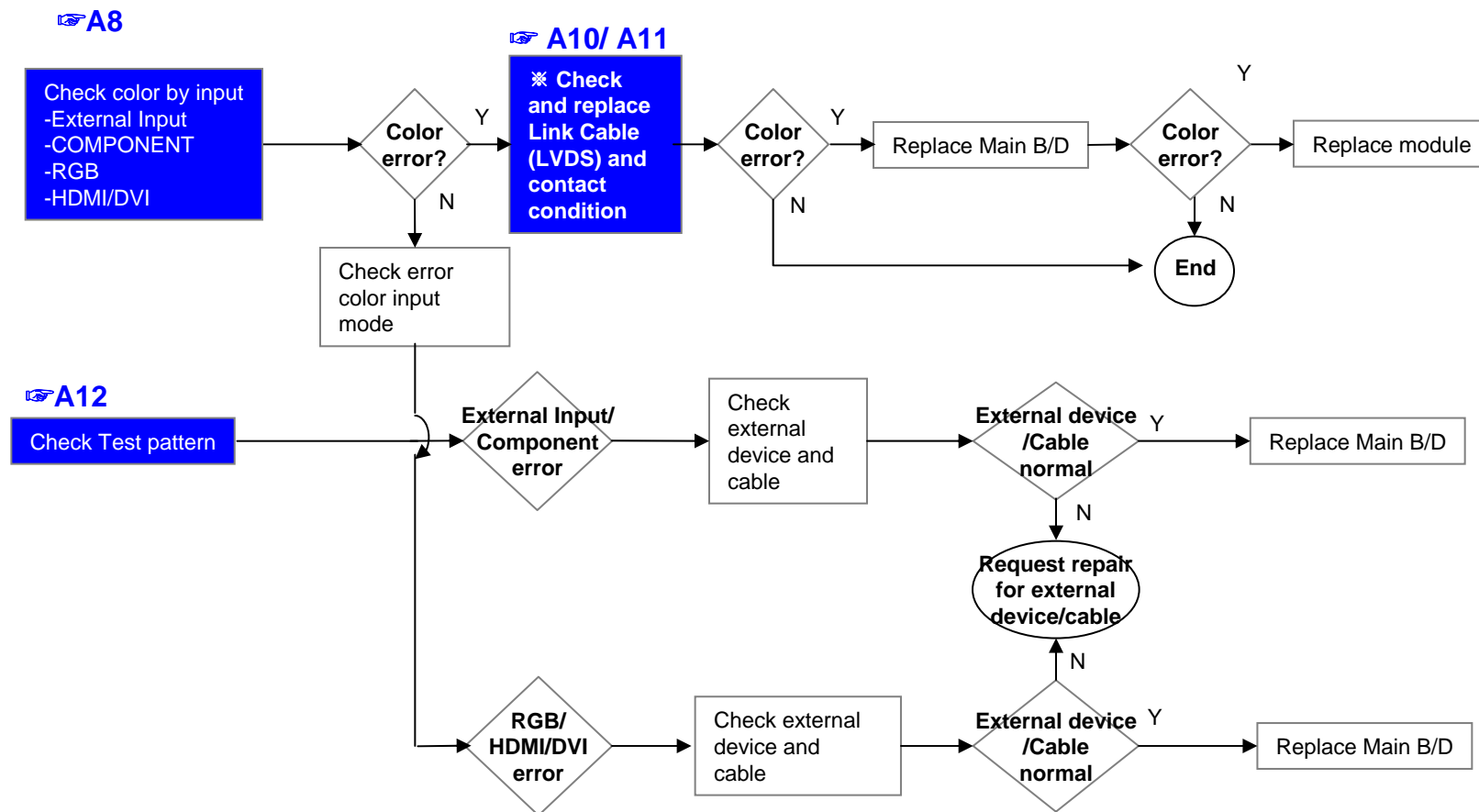
A6

Check RF Signal level

Check RF signal cable (DVB satellite signal or not)
 Check whether other equipments have problem or not.
 (By connecting RF Cable at other equipment)
 → Set-Top-Box, Different maker TV etc



LCD TV	Error symptom	A. Video error	Established date	2010. 12 .14	
		Color error	Revised date		5/14



LCD TV	Error symptom	A. Video error	Established date	2010. 12 .14	
		Vertical / Horizontal bar, residual image, light spot, external device color error	Revised date		6/14

Vertical/Horizontal bar, residual image, light spot

A8

Check color condition by input
 -External Input
 -Component
 -RGB
 -HDMI/DVI

A12

Check Test pattern

Screen normal?

Replace module

Check external device connection condition

Normal?

Request repair for external device

A10/ A11

Check and replace Link Cable

Screen normal?

End

A28

Replace Main B/D (adjust VCOM)

For LGD panel

Replace Main B/D

For other panel

Replace Module

Screen normal?

End

External device screen error-Color error

Check S/W Version

Check version

S/W Upgrade

Normal screen?

End

Check screen condition by input
 -External Input
 -Component
 -RGB
 -HDMI/DVI

External Input error

Component error

RGB error

HDMI/DVI

Connect other external device and cable
 (Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)

Connect other external device and cable
 (Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)

Screen normal?

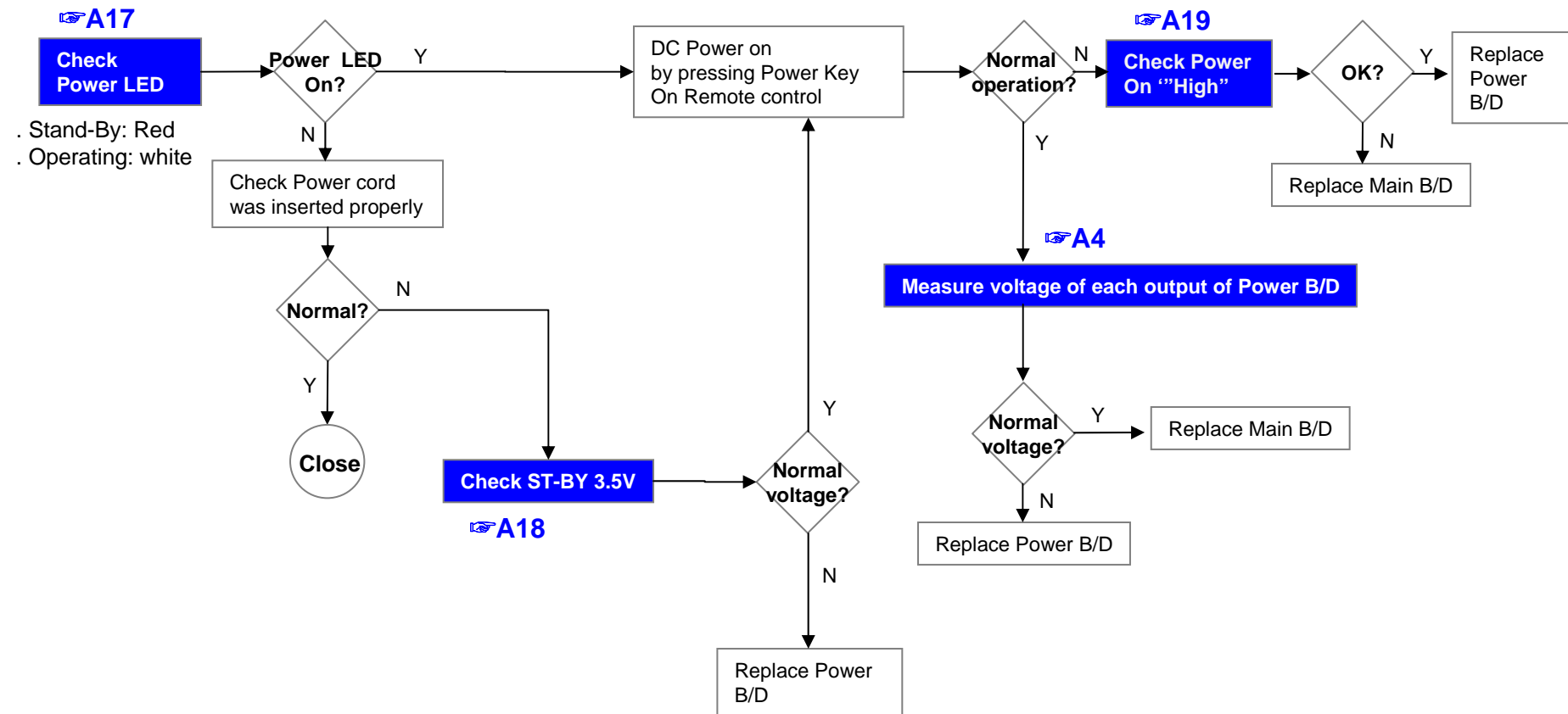
Replace Main B/D

Request repair for external device

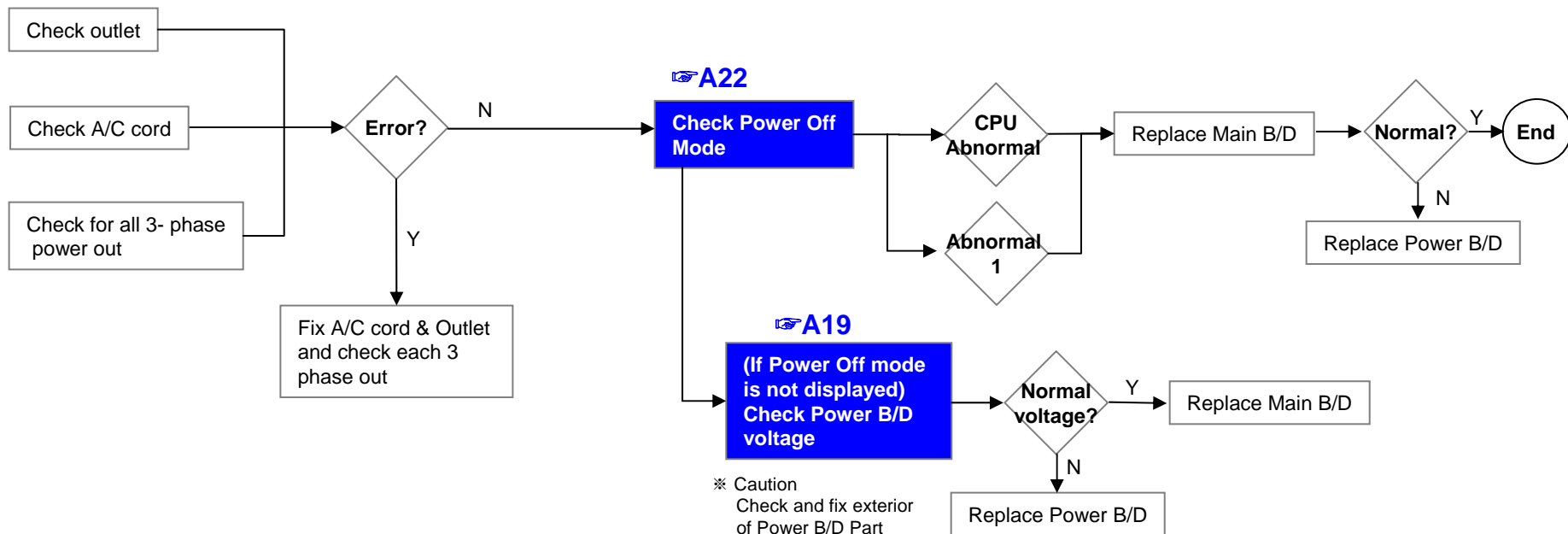
Screen normal?

Replace Main B/D

LCD TV	Error symptom	B. Power error	Established date	2010. 12 .14	
		No power	Revised date		7/14



LCD TV	Error symptom	B. Power error	Established date	2010. 12 .14	
		Off when on, off while viewing, power auto on/off	Revised date		8/14



* Please refer to the all cases which can be displayed on power off mode.

Status	Power off List	Explanation
Normal	"POWEROFF_REMOTEKEY"	Power off by REMOTE CONTROL
	"POWEROFF_OFFTIMER"	Power off by OFF TIMER
	"POWEROFF_SLEEPTIMER"	Power off by SLEEP TIMER
	"POWEROFF_INSTOP"	Power off by INSTOP KEY
	"POWEROFF_AUTOOFF"	Power off by AUTO OFF
	"POWEROFF_ONTIMER"	Power off by ON TIMER
	"POWEROFF_RS232C"	Power off by RS232C
	"POWEROFF_RESREC"	Power off by Reserved Record
	"POWEROFF_RECEND"	Power off by End of Recording
	"POWEROFF_SWDOWN"	Power off by S/W Download
	"POWEROFF_UNKNOWN"	Power off by unknown status except listed case
Abnormal	" POWEROFF_ABNORMAL1 "	Power off by abnormal status except CPU trouble
	" POWEROFF_CPUABNORMAL "	Power off by CPU Abnormal

LCD TV

Error
symptom

C. Audio error

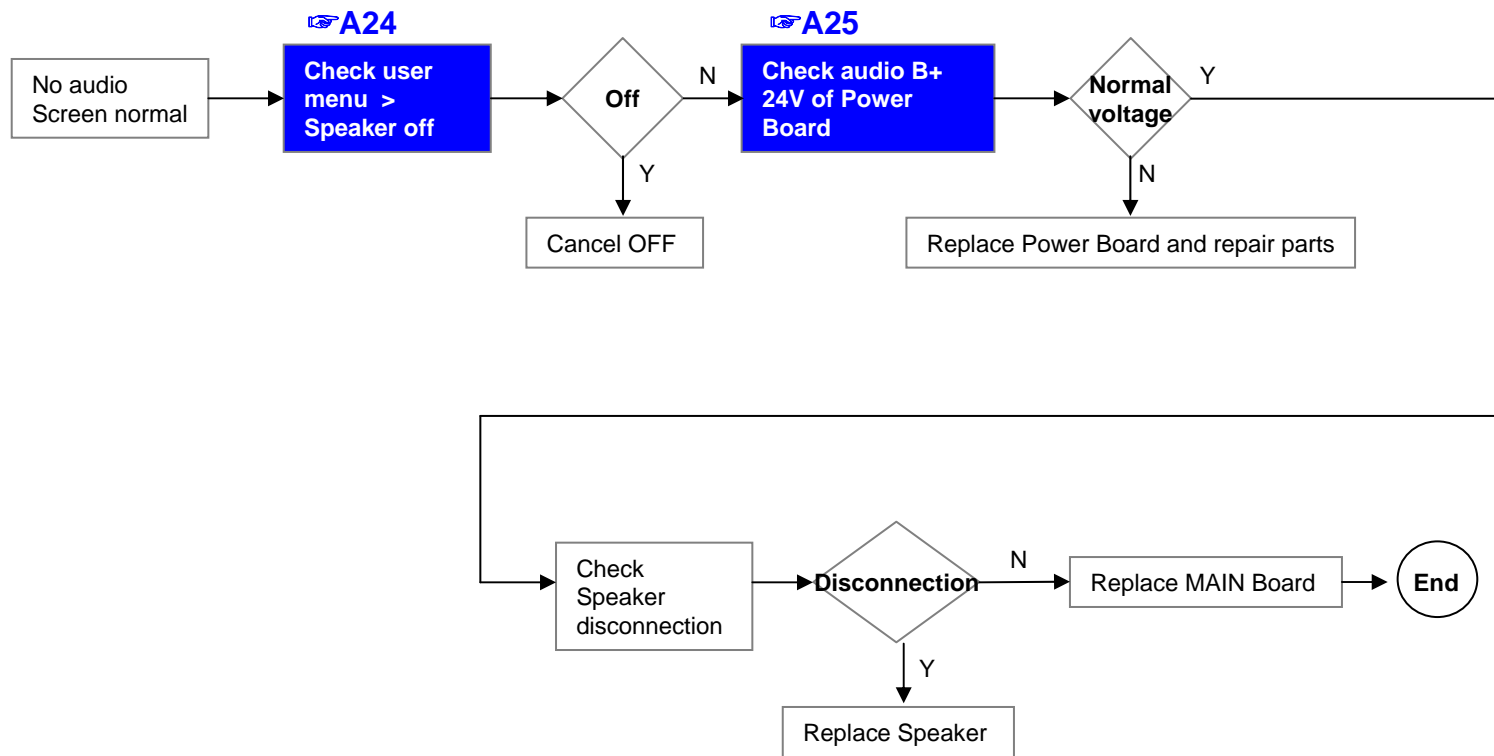
Established
date

2010. 12 .14

No audio/ Normal video

Revised date

9/14



LCD TV

Error
symptom

C. Audio error

Established
date

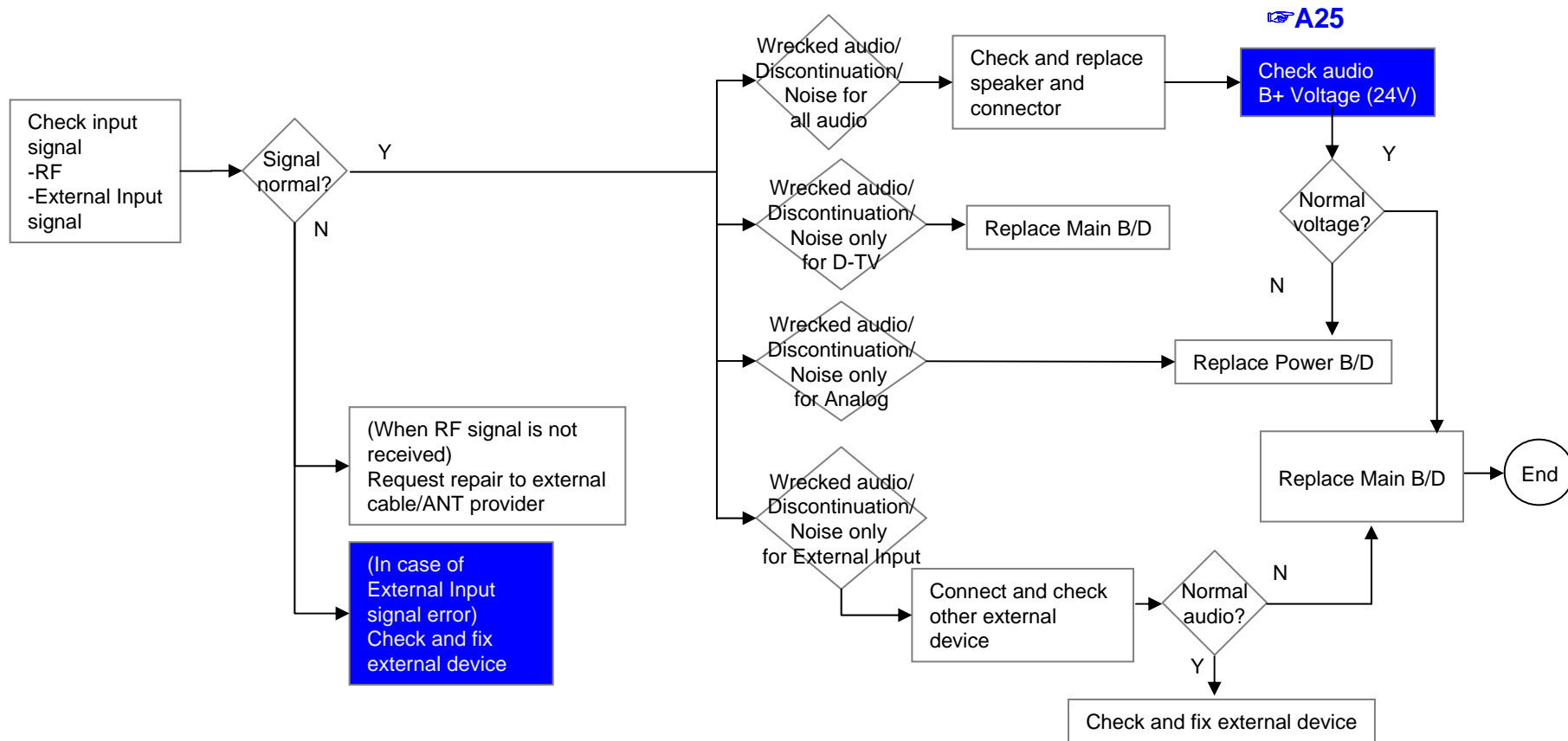
2010. 12 .14

Wrecked audio/ discontinuation/noise

Revised date

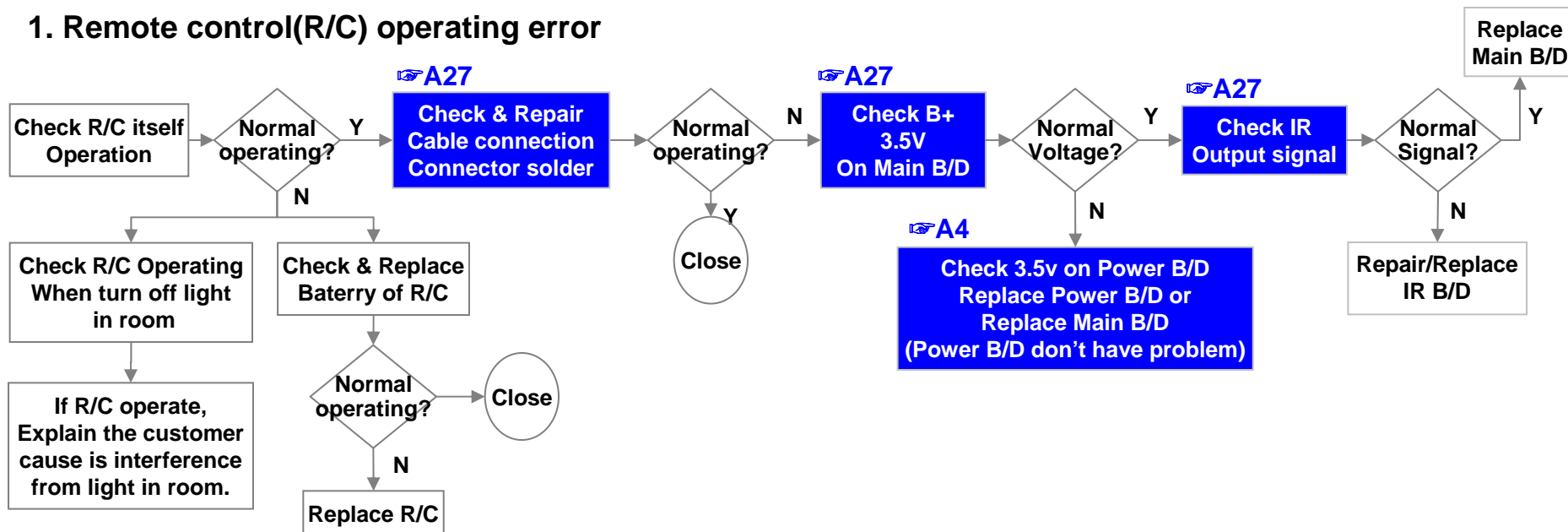
10/14

→ abnormal audio/discontinuation/noise is same after “Check input signal” compared to No audio



LCD TV	Error symptom	D. General Function Problem	Established date	2010. 12 .14	
		Remote control & Local switch checking	Revised date		11/14

1. Remote control(R/C) operating error



LCD TV

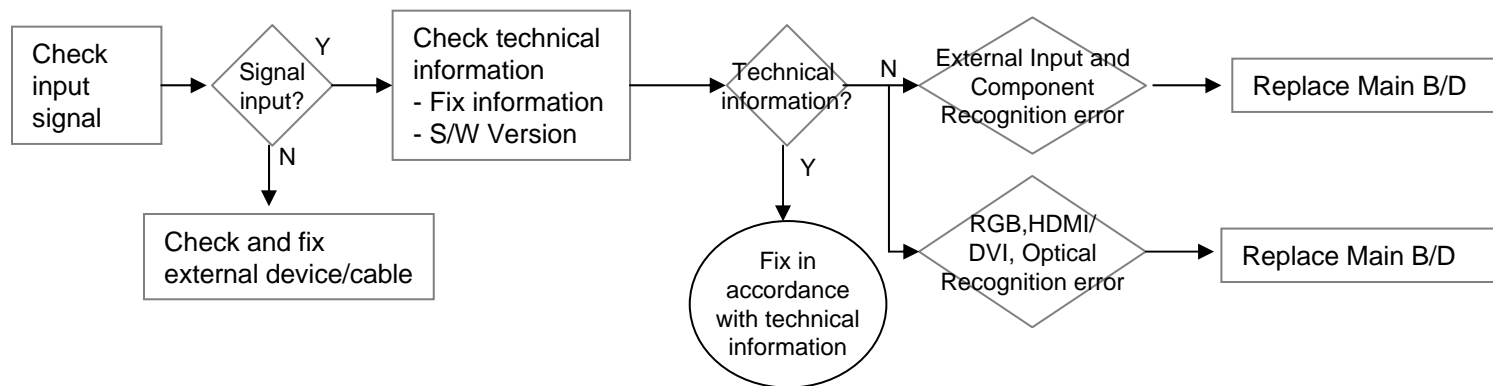
Error
symptom**D. Function error**Established
date

2010. 12 .14

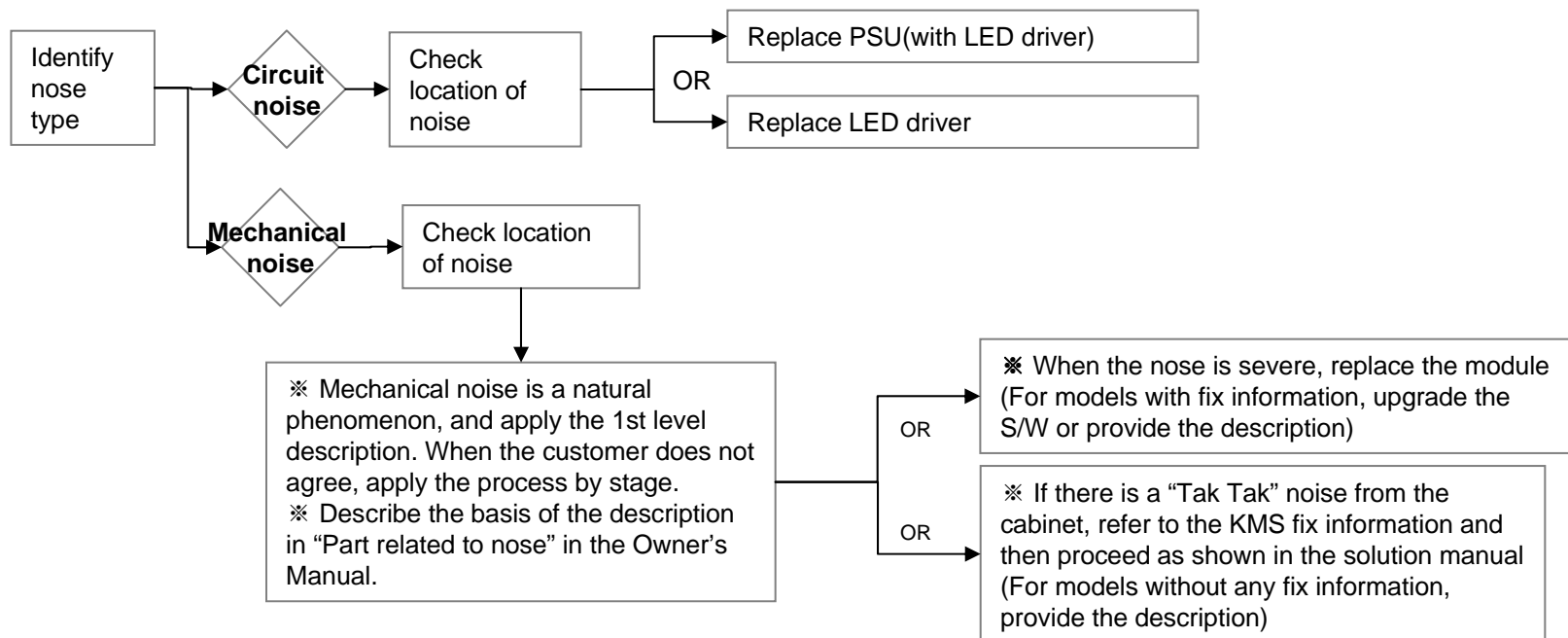
External device recognition error

Revised date

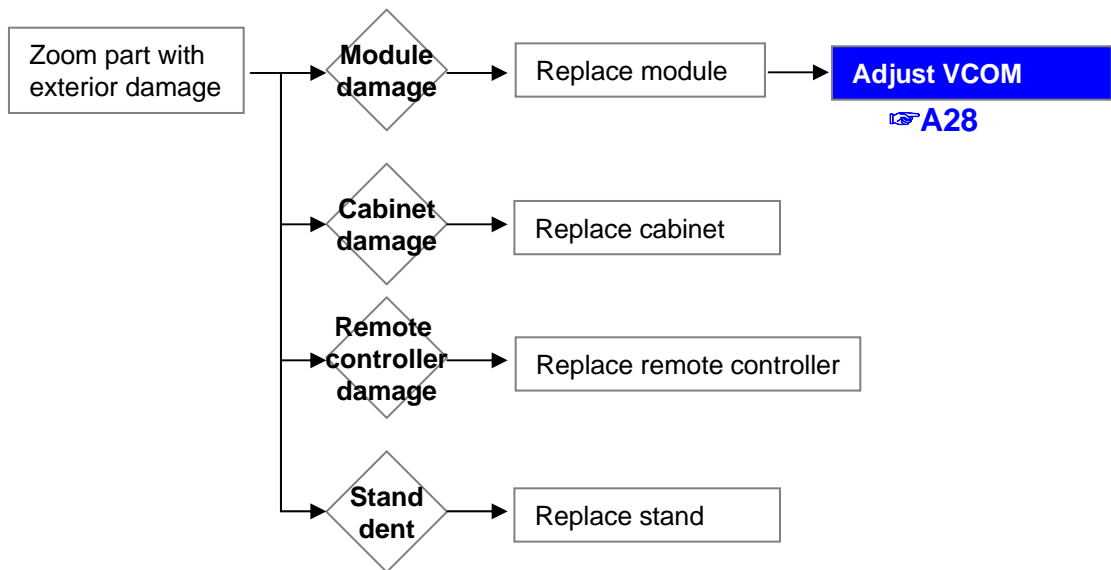
12/14



LCD TV	Error symptom	E. Noise	Established date	2010. 12 .14	
		Circuit noise, mechanical noise	Revised date		13/14



LCD TV	Error symptom	F. Exterior defect	Established date	2010. 12 .14	
		Exterior defect	Revised date		14/14



Contents of LCD TV Standard Repair Process Detail Technical Manual

No.	Error symptom	Content	Page	Remarks
1	A. Video error_ No video/Normal audio	Check LCD back light with naked eye	A1	
2		LED driver B+ 24V measuring method	A2	
3		Check White Balance value	A3	
4		Power Board voltage measuring method	A4	
6	A. Video error_ No video/Video lag/stop	TUNER input signal strength checking method	A6	
7		LCD-TV Version checking method	A7	
9	A. Video error_Color error	LCD TV connection diagram	A8	
10		Tuner Checking Part	A9	
11		Check Link Cable (LVDS) reconnection condition	A10 A11	
12		Adjustment Test pattern - ADJ Key	A12	
13	A. Video error_Vertical/Horizontal bar, residual image, light spot	LCD TV connection diagram	A8	
14		Check Link Cable (LVDS) reconnection condition	A10 A11	A10 : LVDS A11 : Driver b'd
15		Adjustment Test pattern - ADJ Key	A12	
16	<Appendix> Defected Type caused by T-Con/ Inverter/ Module	Exchange T-Con Board (1)	A-1/5	
17		Exchange T-Con Board (2)	A-2/5	
18		Exchange LED driver Board (PSU)	A-3/5	
19		Exchange Module itself (1)	A-4/5	
20		Exchange Module itself (2)	A-5/5	

Continue to the next page

Contents of LCD TV Standard Repair Process Detail Technical Manual

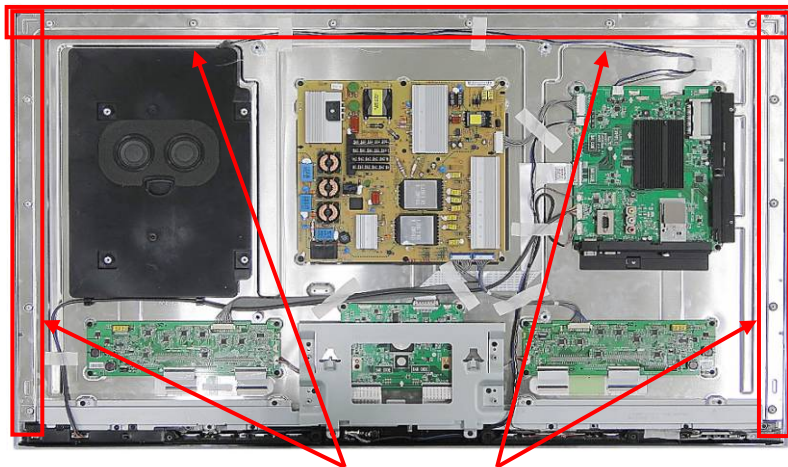
Continued from previous page

No.	Error symptom	Content	Page	Remarks
21	B. Power error_No power	Check front display LED	A17	
22		Check power input Voltage & ST-BY 5V	A18	
23		Checking method when power is ON	A19	
24		POWER BOARD voltage measuring method	A4	
25				
26	B. Power error_Off when on, off while viewing	POWER OFF MODE checking method	A22	
27	B. Power error_Off when on, off while viewing	POWER BOARD PIN voltage checking method	A19	
28	C. Audio error_No audio/Normal video	Checking method in menu when there is no audio	A24	
29		Voltage and speaker checking method when there is no audio	A25	
30	C. Audio error_Wrecked audio/discontinuation	Voltage and speaker checking method in case of audio error	A25	
31	D. Function error_ No response in remote controller, key error	Remote controller operation checking method	A27	
32	D. VCOM Adjustment	Sequence of the Vcom adjustment	A28	

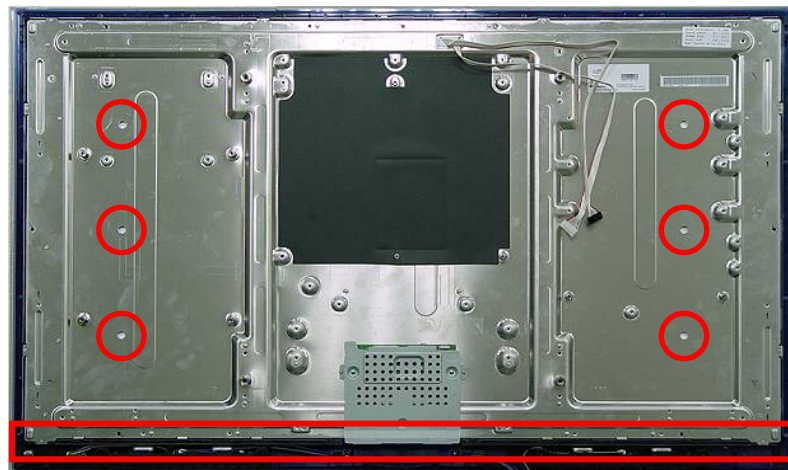
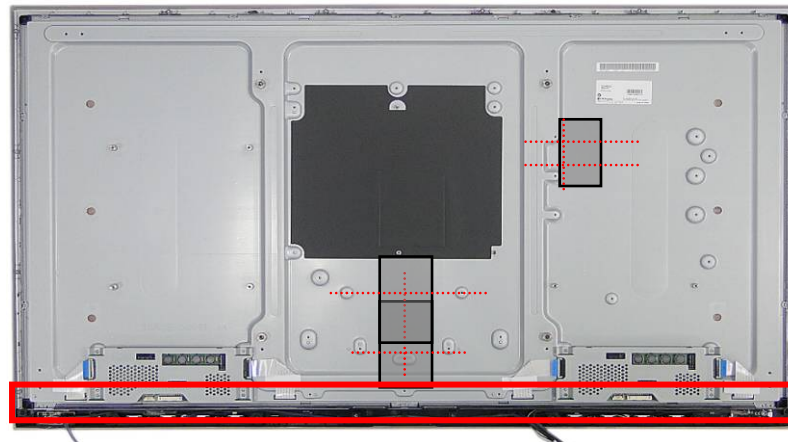
Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2010. 12 .14	
	Content	Check LCD back light with naked eye	Revised date		A1

<XXLW950X MODELS>



<XXLW770X MODELS>

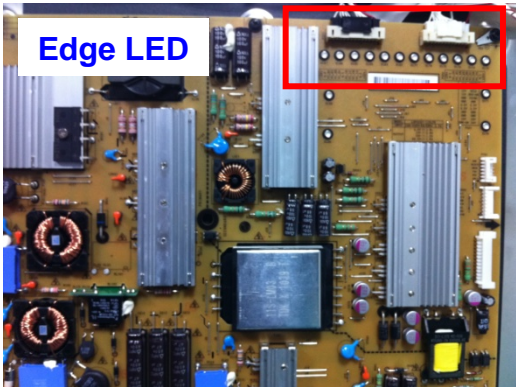
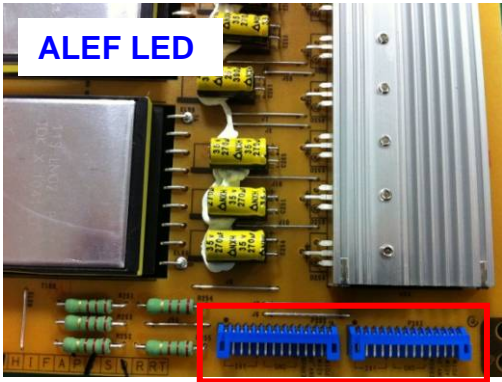


After turning on the power and disassembling the case, check with the naked eye, whether you can see light from module

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2010. 12 .14	A2
	Content	LED driver B+ 24V measuring method	Revised date		

Check the DC 24V, 12V, 3.5V and Inverter on



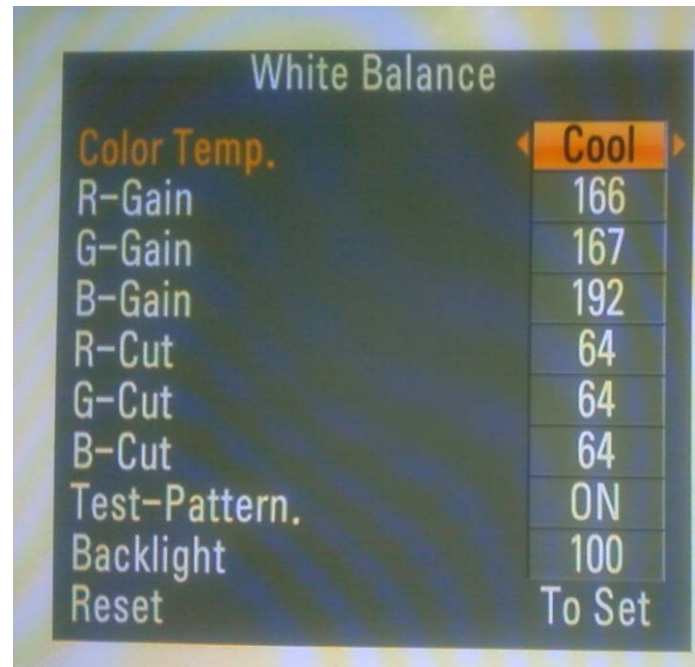
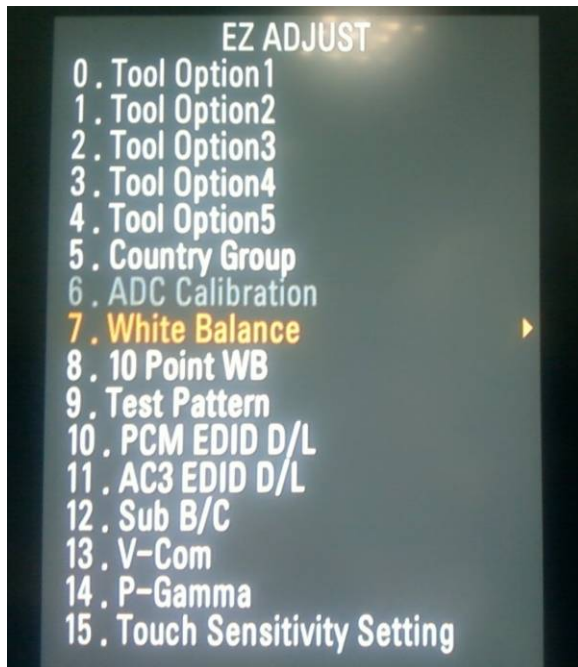
P202	
1~5	24V
6~10	GND
11	Error
12	Inverter ON
13	A-dim
14	P-dim

P203	
1~5	24V
6~10	GND
11	Error
12	Inverter ON
13	A-dim
14	P-dim

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2010. 12 .14	
	Content	Check White Balance value	Revised date		A3

<ALL MODELS>

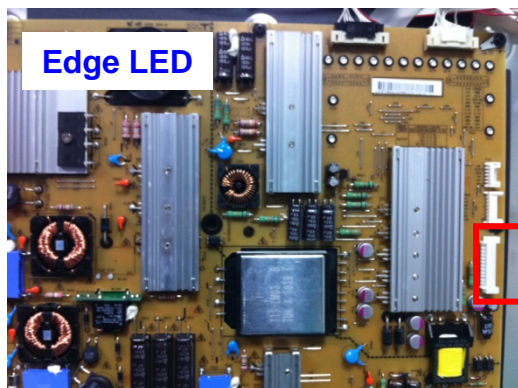
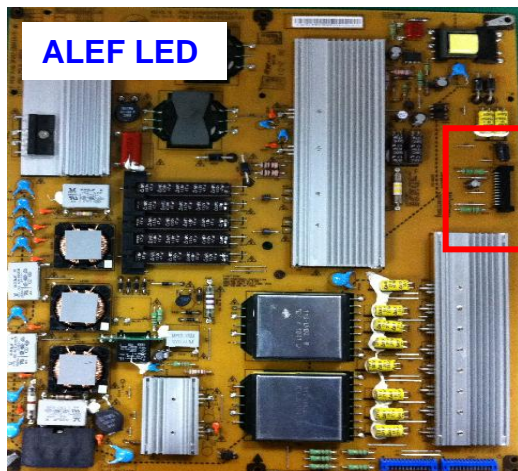


Entry method

1. Press the ADJ button on the remote controller for adjustment.
2. Enter into White Balance of item 7.
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/ Audio	Established date	2010. 12 .14	
	Content	Power Board voltage measuring method	Revised date		A4



Check the DC 24V, 12V, 3.5V.

24 Pin (Power Board ↔ Main Board) - 공통			
SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	GND
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim LED : N.C
21	12V	22	PWM Dim #1
23	N.C • Lamp SCANNING Model : PWM Dim #2	24	Error-out

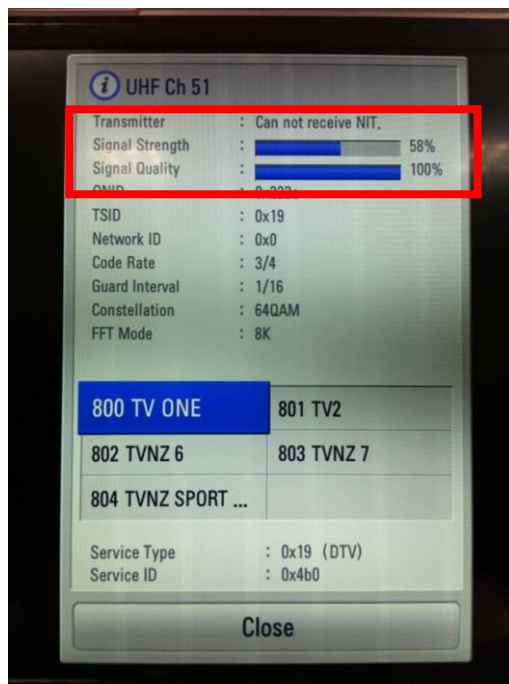
Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2010. 12 .14	
	Content	TUNER input signal strength checking method	Revised date		A6

<ALL MODELS>



MENU → Set up → support → signal test
→ select channel



When the signal is strong, use the attenuator (-10dB, -15dB, -20dB etc.)



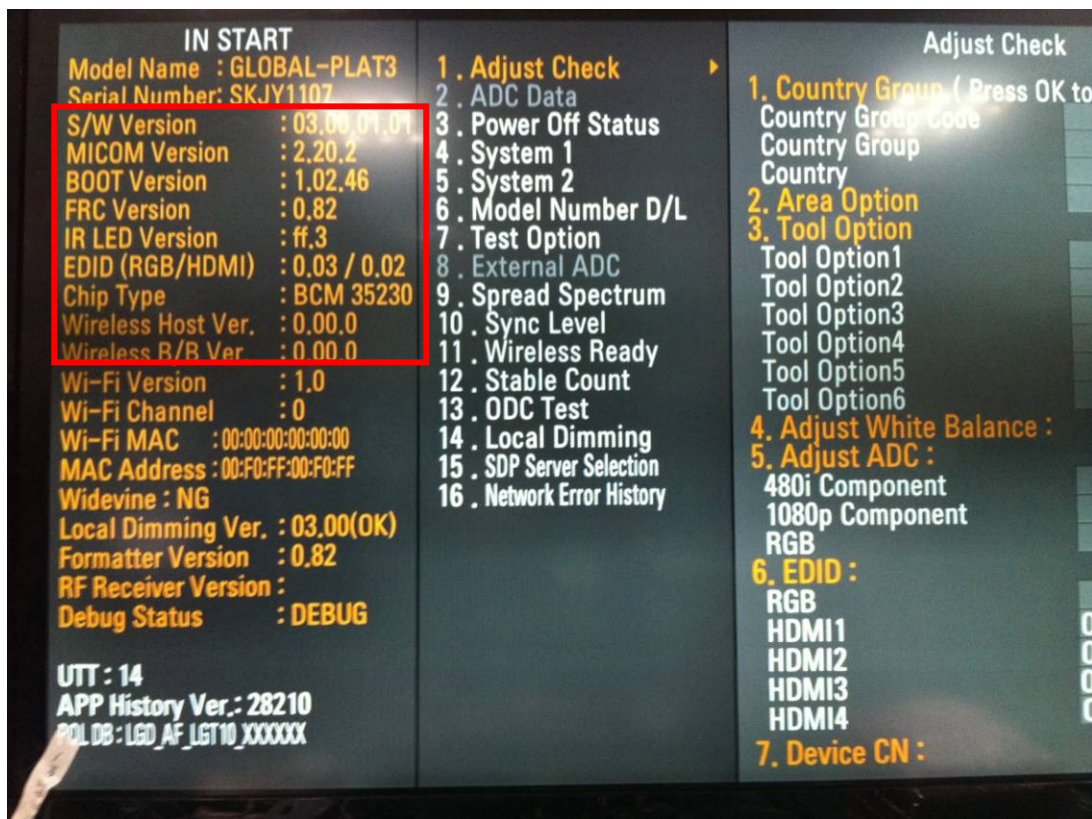
Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2010. 12 .14	
	Content	LCD-TV Version checking method	Revised date		A7

<ALL MODELS>

1. Checking method for remote controller for adjustment

Version

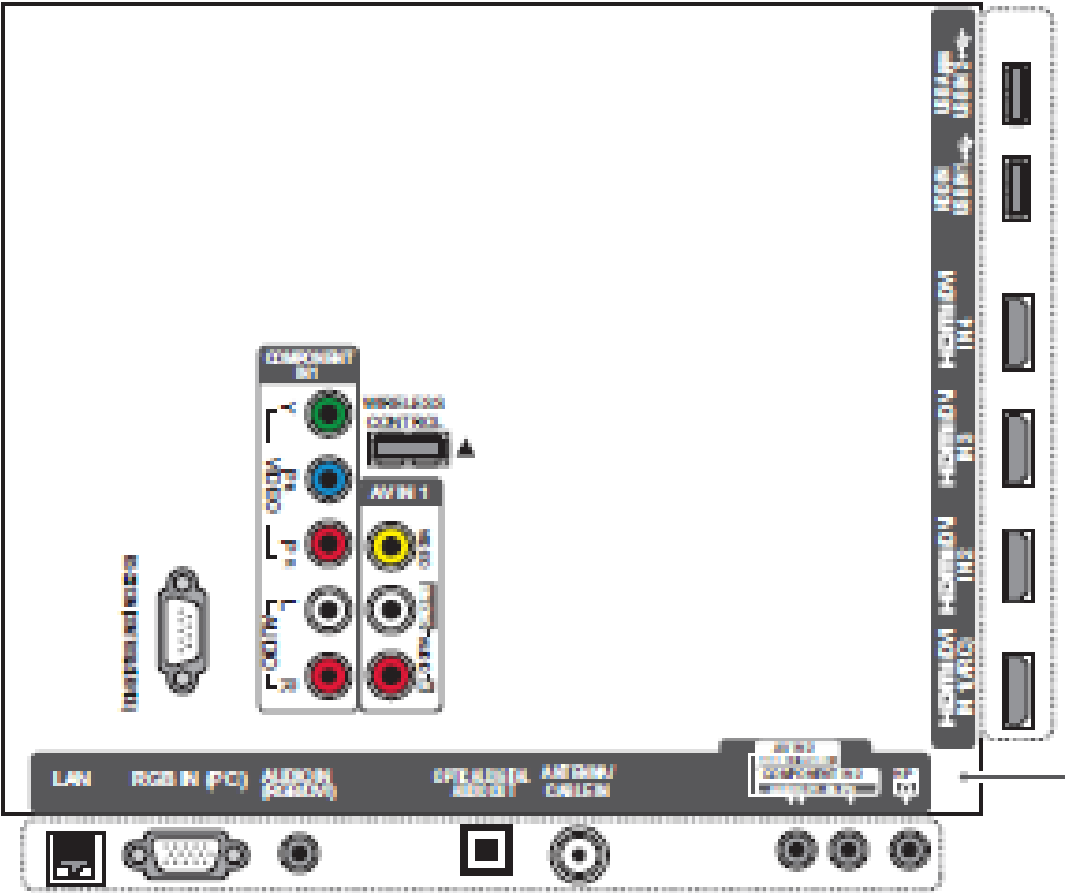


Press the IN-START with the remote controller for adjustment

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error _ Vertical/Horizontal bar, residual image, light spot	Established date	2010. 12 .14	
	Content	LCD TV connection diagram (1)	Revised date		A8

****LW95** , **LW77** , **LV55** , **LW65** , **LW57****

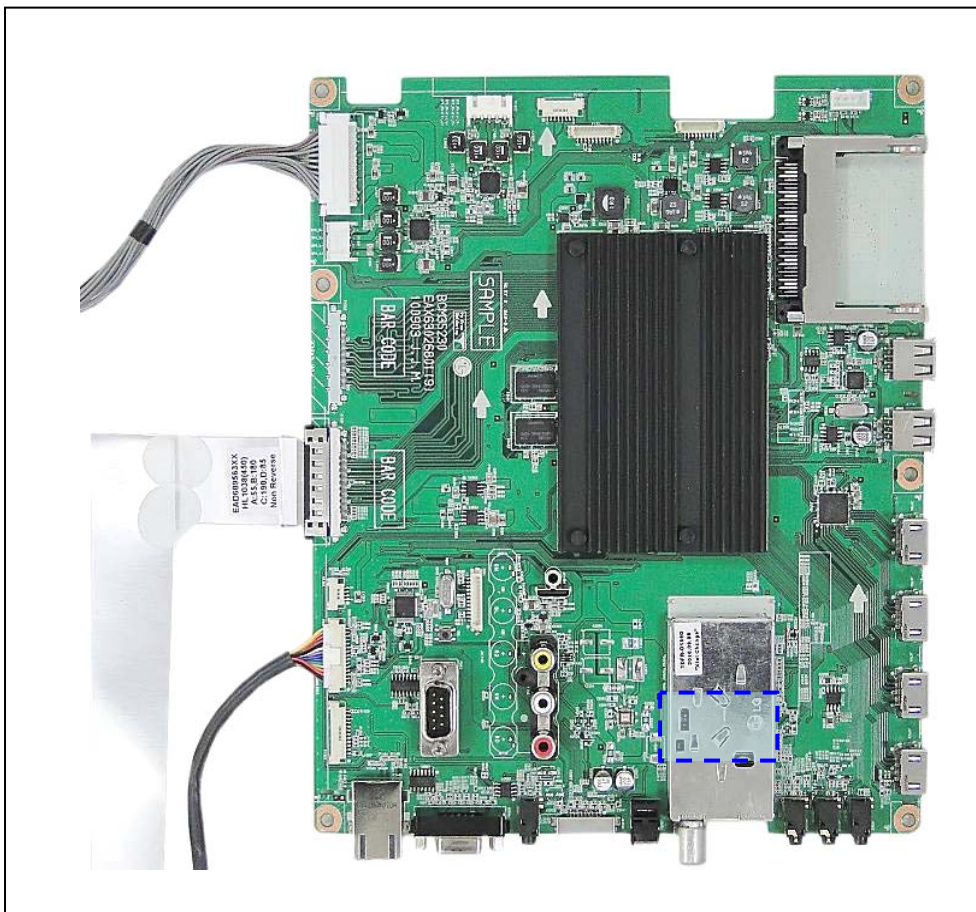


As the part connecting to the external input, check the screen condition by signal

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2010. 12 .14	
	Content	TUNER checking part	Revised date		A9

<ALL MODELS>



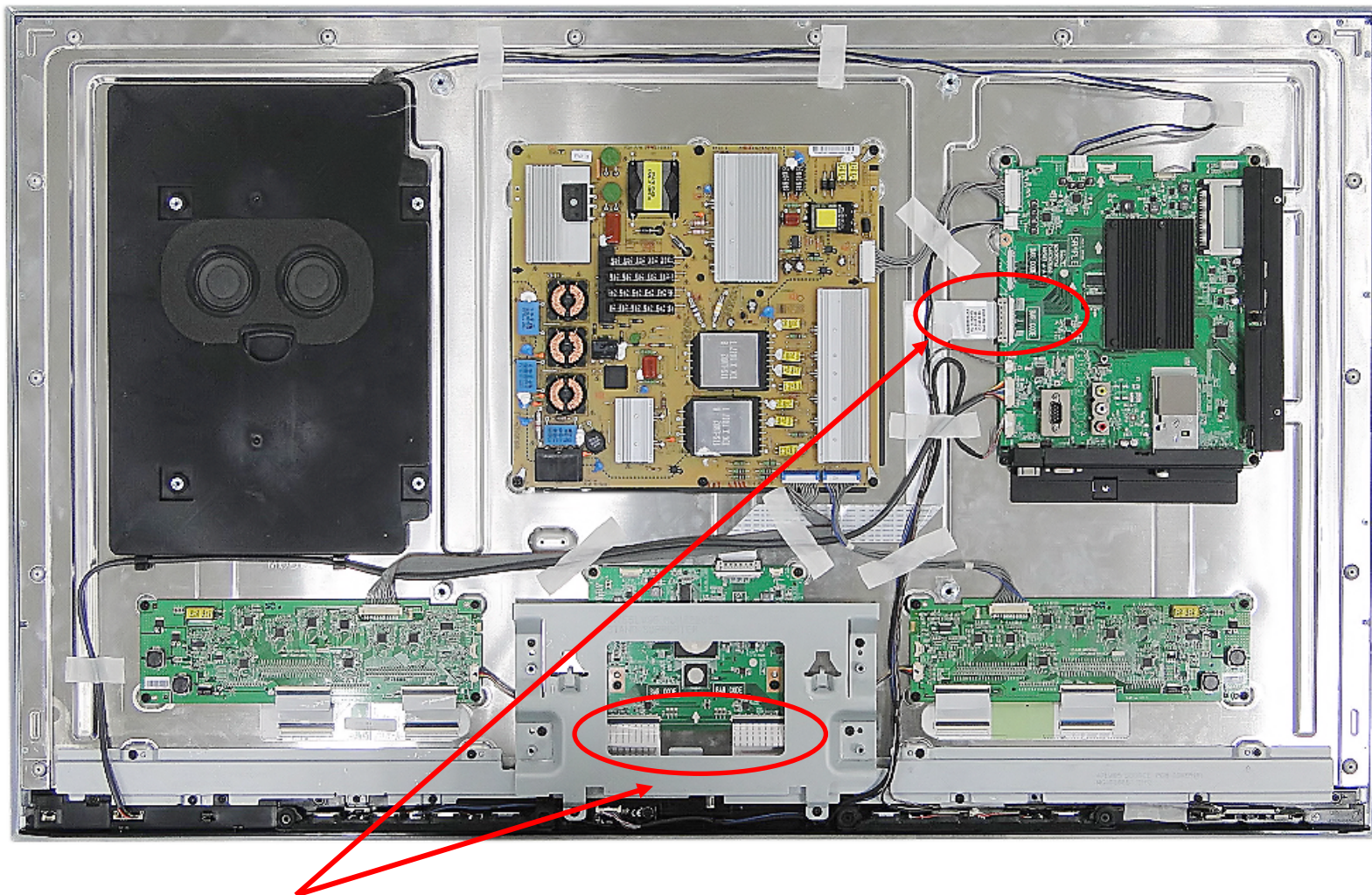
Checking method:

1. Check the signal strength or check whether the screen is normal when the external device is connected.
2. After measuring each voltage from power supply, finally replace the MAIN BOARD.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2010. 12 .14	A10
	Content	Check Link Cable (LVDS) reconnection condition	Revised date		

<ALL MODELS>

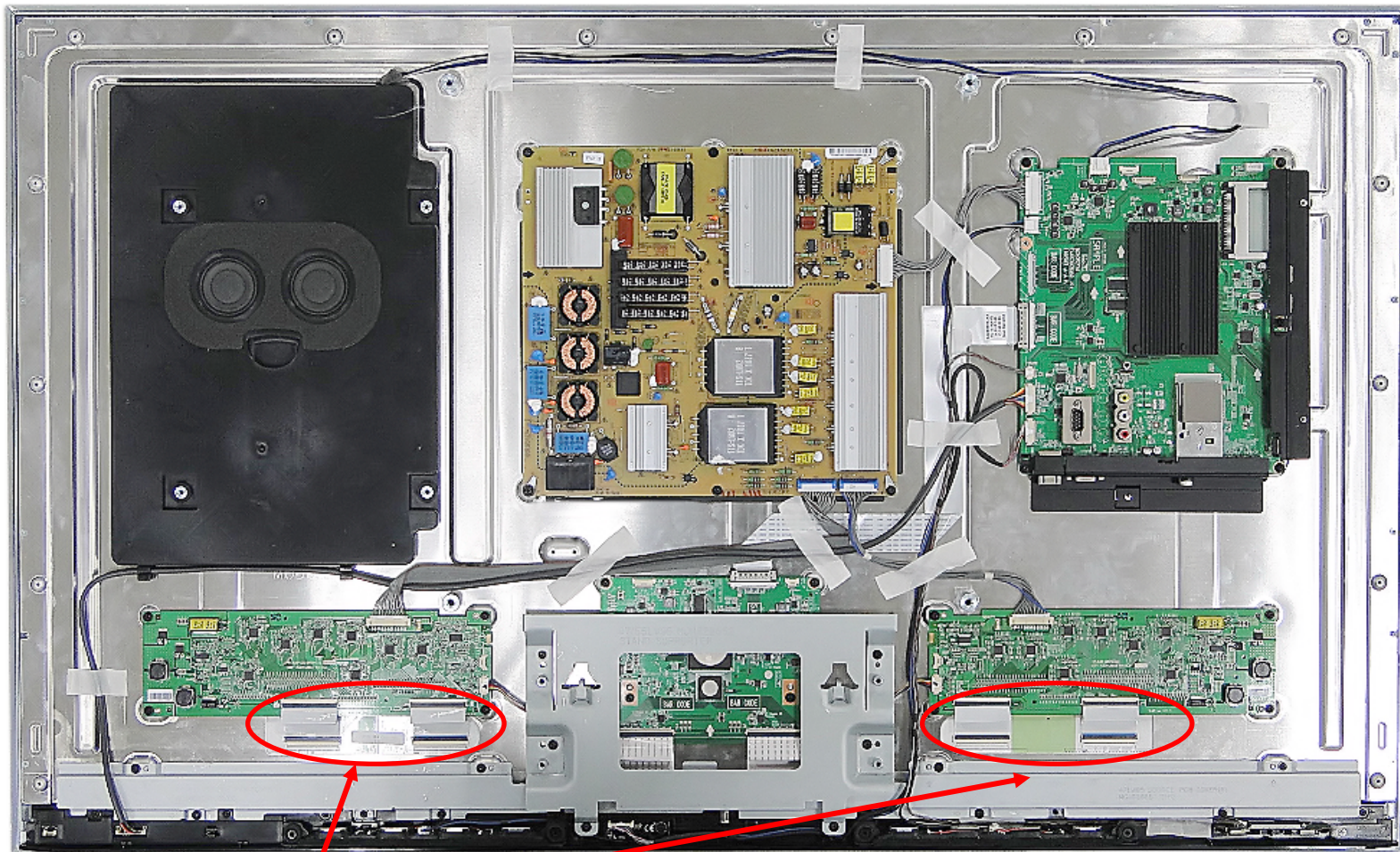


Check the contact condition of the Link Cable, especially dust or mis insertion.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2010. 12 .14	A11
	Content	Check Link Cable reconnection condition	Revised date		

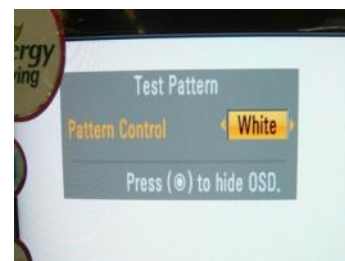
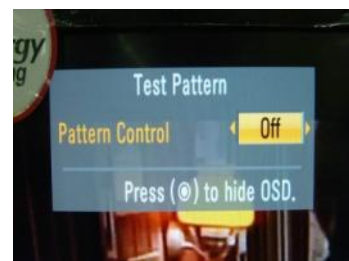
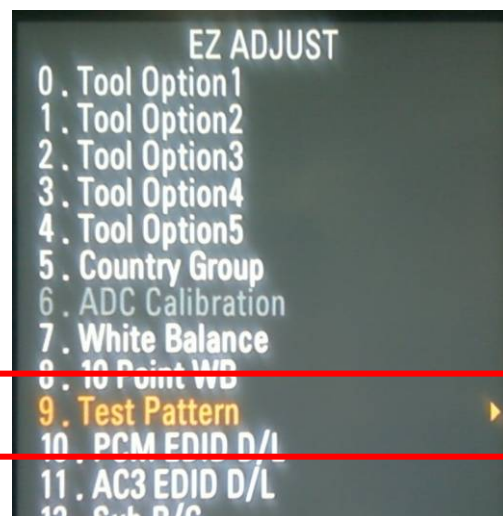
<ALL MODELS>



Check the contact condition of the Link Cable, especially dust or mis insertion.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2010. 12 .14	
	Content	Adjustment Test pattern - ADJ Key	Revised date		A12



You can view 6 types of patterns using the ADJ Key

Checking item : 1. Defective pixel 2. Residual image 3. MODULE error (ADD-BAR,SCAN BAR..) 4.Video error (Classification of MODULE or Main-B/D!)

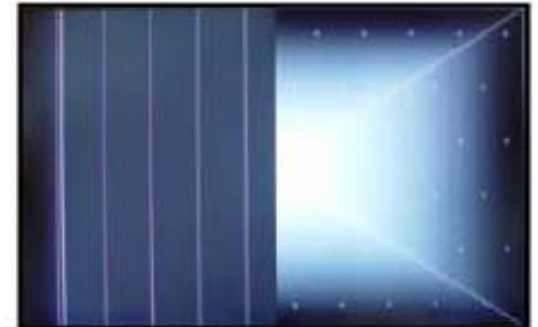
Appendix : Exchange T-Con Board (1)



Solder defect, CNT Broken



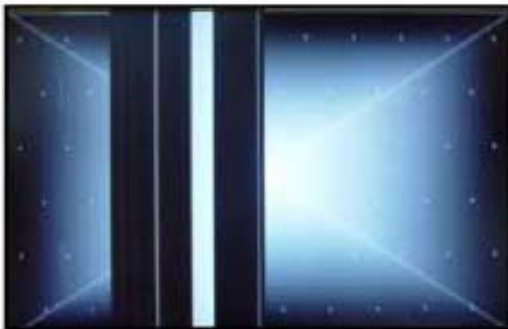
Solder defect, CNT Broken



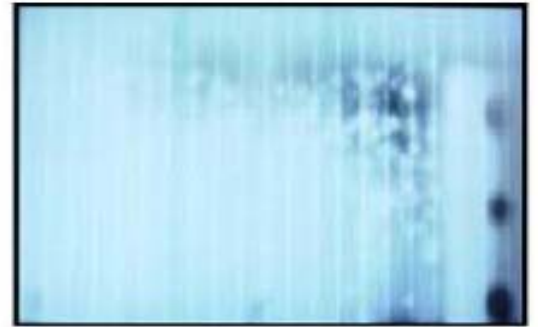
Solder defect, CNT Broken



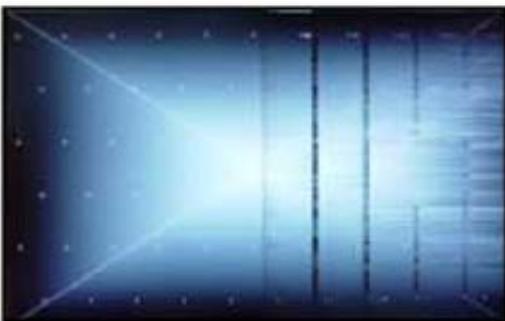
Solder defect, CNT Broken



Solder defect, CNT Broken



Abnormal Power Section



Solder defect, Short/Crack

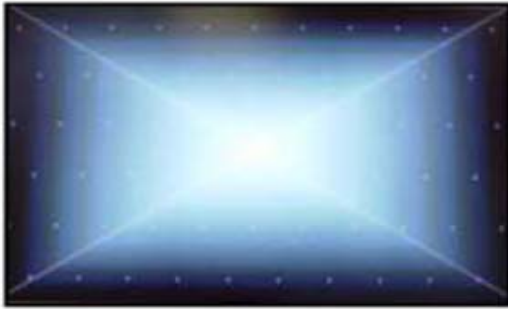


Abnormal Power Section



Solder defect, Short/Crack

Appendix : Exchange T-Con Board (2)



Abnormal Power Section



Abnormal Power Section



Solder defect, Short/Crack



Solder defect, Short/Crack



Fuse Open, Abnormal power section



Abnormal Display



GRADATION



Noise



GRADATION

Appendix : Exchange PSU(LED driver)



No Light



Dim Light



Dim Light



Dim Light



No picture/Sound Ok

Appendix : Exchange the Module (1)



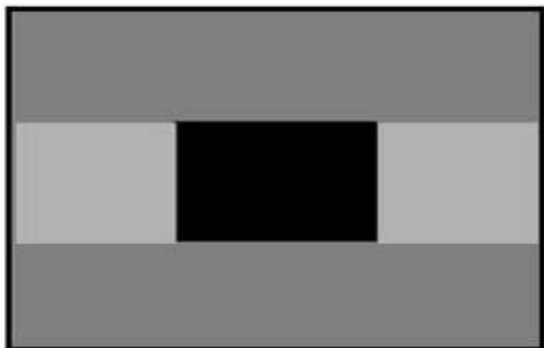
Panel Mura, Light leakage



Panel Mura, Light leakage



Press damage



Crosstalk



Press damage



Crosstalk

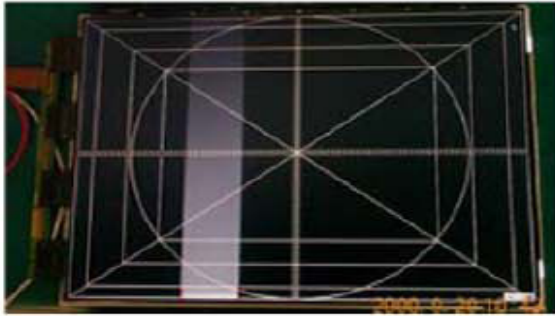


Press damage

Un-repairable Cases

In this case please exchange the module.

Appendix : Exchange the Module (2)



Vertical Block
Source TAB IC Defect



Vertical Line
Source TAB IC Defect



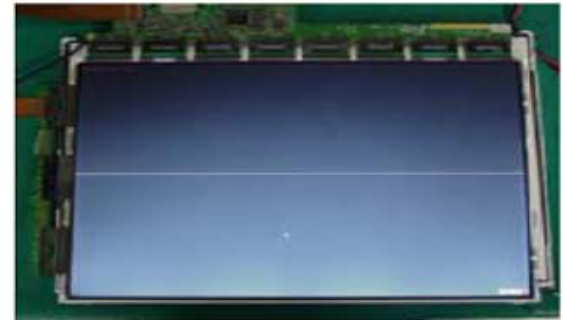
Vertical Block
Source TAB IC Defect



Horizontal Block
Gate TAB IC Defect



Horizontal Block
Gate TAB IC Defect



Horizontal line
Gate TAB IC Defect



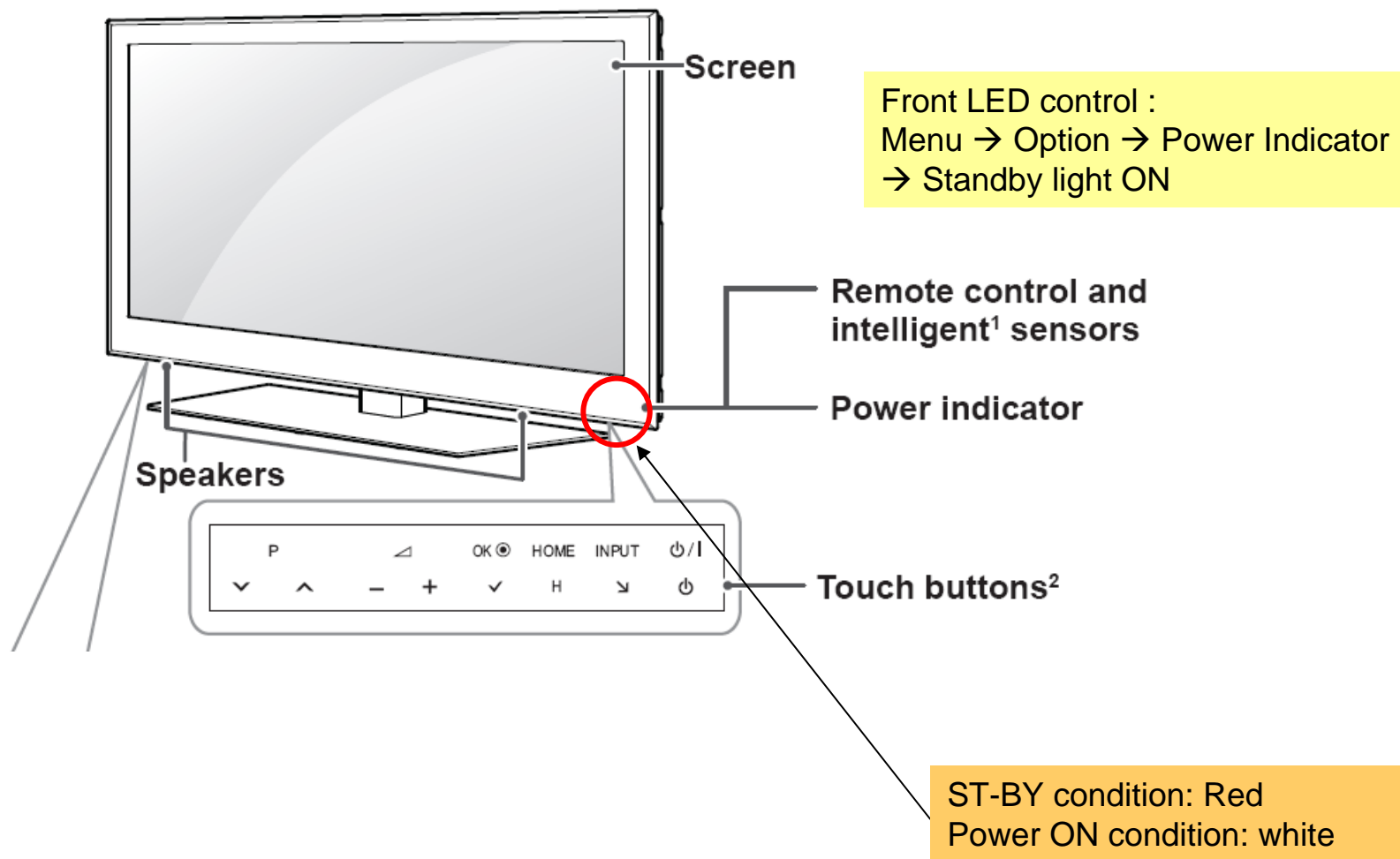
Horizontal Block
Gate TAB IC Defect

Un-repairable Cases

In this case please exchange the module.

Standard Repair Process Detail Technical Manual

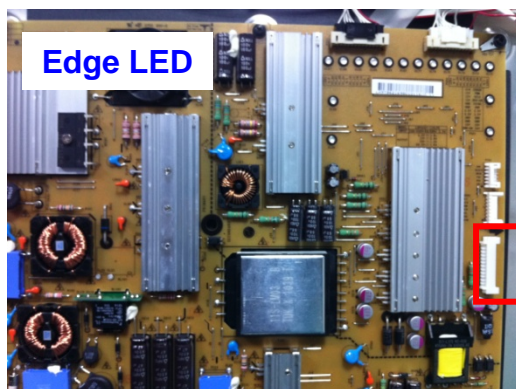
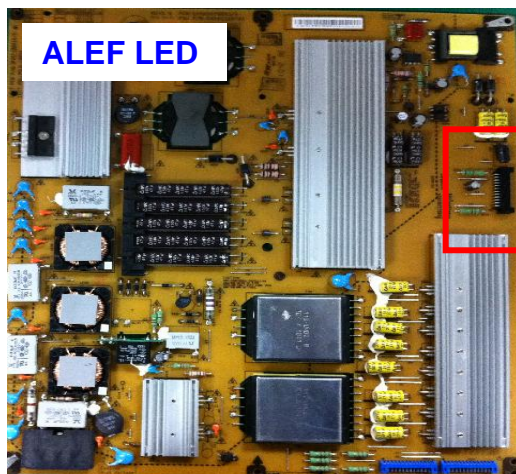
LCD TV	Error symptom	B. Power error _No power	Established date	2010. 12 .14	
	Content	Check front display LED	Revised date		A17



Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2010. 12 .14	
	Content	Check power input voltage and ST-BY 5V	Revised date		A18

For '10 models, there is no voltage out for st-by purpose.
When st-by, only 3.5V is normally on.

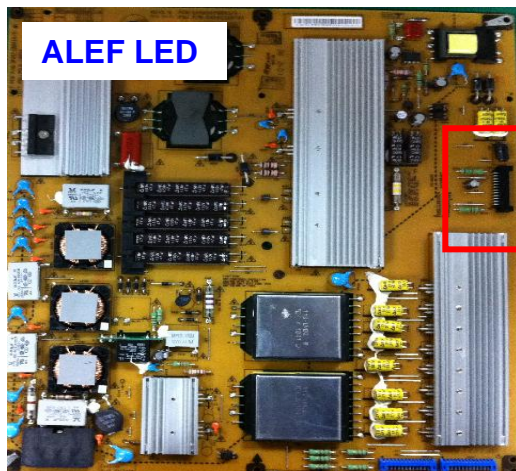


Check the DC 20V/24V, 12V, 3.5V.

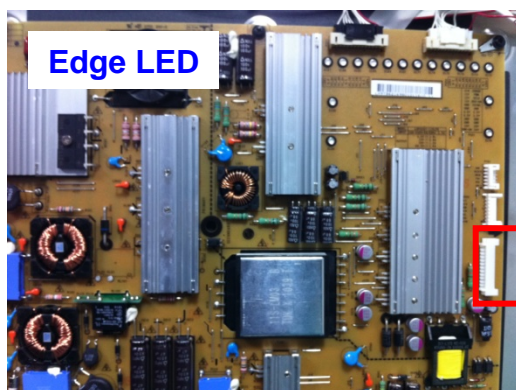
24 Pin (Power Board ↔ Main Board) - 공통			
SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	GND
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim LED : N.C
21	12V	22	PWM Dim #1
23	N.C • Lamp SCANNING Model : PWM Dim #2	24	Error-out

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2010. 12 .14	A19
	Content	Checking method when power is ON	Revised date		



Check "power on" pin is high

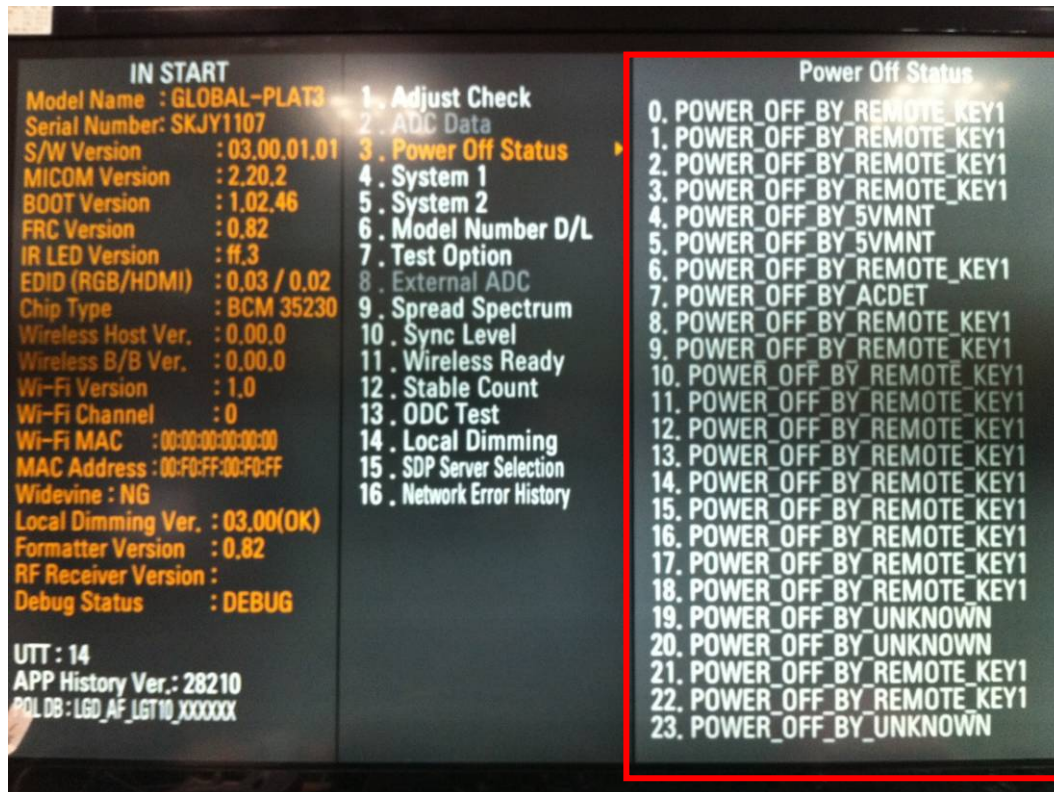


24 Pin (Power Board ↔ Main Board) - 공통			
SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	GND
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim LED : N.C
21	12V	22	PWM Dim #1
23	N.C • Lamp SCANNING Model : PWM Dim #2	24	Error-out

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _Off when on, off whiling viewing	Established date	2010. 12 .14	
	Content	POWER OFF MODE checking method	Revised date		A22

<ALL MODELS>



Entry method

1. Press the IN-START button of the remote controller for adjustment
2. Check the entry into adjustment item 3

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2010. 12 .14	
	Content	Checking method in menu when there is no audio	Revised date		A24

<ALL MODELS>



Checking method

1. Press the MENU button on the remote controller
2. Select the AUDIO function of the Menu
3. Select TV Speaker from Off to On

Standard Repair Process Detail Technical Manual

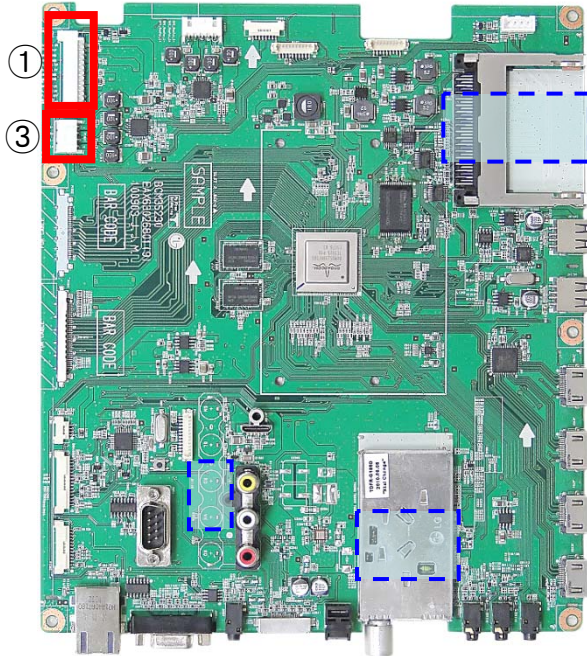
LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2010. 12 .14	A25
	Content	Voltage and speaker checking method when there is no audio	Revised date		

<ALL MODELS>



②

24 Pin (Power Board ↔ Main Board) - 공통			
SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	GND
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim LED : N.C
21	12V	22	PWM Dim #1
23	N.C • Lamp SCANNING Model : PWM Dim #2	24	Error-out



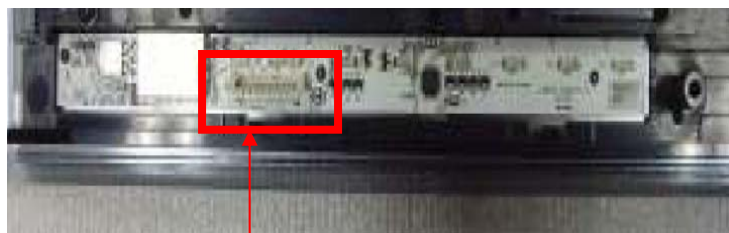
Checking order when there is no audio

- ① Check the contact condition of or 24V connector of Main Board
- ② Measure the 24V input voltage supplied from Power Board
(If there is no input voltage, remove and check the connector)
- ③ Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and output terminal, the speaker is normal.

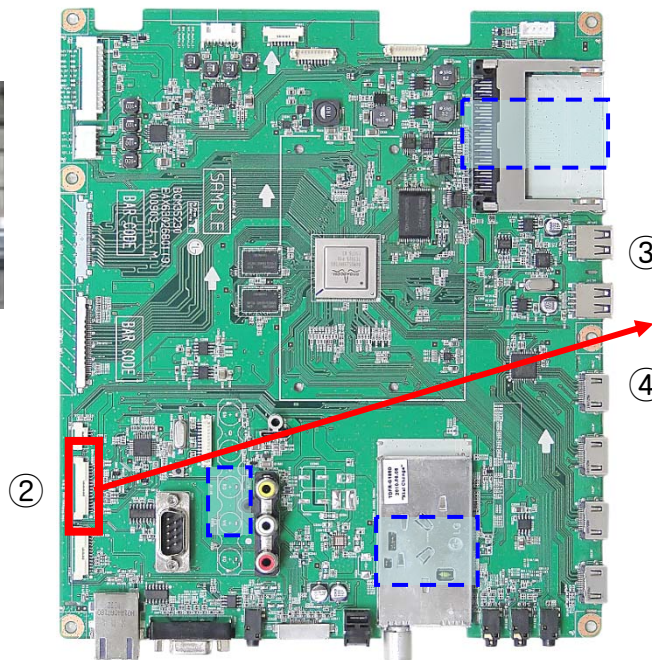
Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	D. Function error_ No response in remote controller, key error	Established date	2010. 12 .14	
	Content	Remote controller operation checking method	Revised date		A27

<ALL MODELS>



①



P8200	
1	SCL
2	SDA
3	GND
4	KEY1
5	KEY2
6	St 3.5V
7	GND
8	LED B/loao PWM
9	IR
10	GND
11	3.3V_Normal
12	LED_R/BUZZ
13	GND
14	ST_SCL
15	ST_SDA

Checking order

- 1, 2. Check IR cable condition between IR & Main board.
3. Check the st-by 3.3V on the terminal 6.
4. When checking the Pre-Amp when the power is in ON condition, it is normal when the Analog Tester needle moves slowly, and defective when it does not move at all.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	D. VCOM Adjustment	Established date	2010. 12 .14	
	Content	Sequence of the Vcom adjustment	Revised date		A28

1. Case

- LCD module change
- T-Con board change

2. Equipment

- Service Remote controller

3. Adjust sequence

- Press the 'adj' key
 - select V-COM
 - As pushing the right or the left button on the remote controller, And find the V-COM value Which is no or minimized the Flicker.
- (If there is no flicker at default value, Press the exit key and finish the VCOM adjustment.)**
- Push the OK key to store the value. Then the message "Saving OK" is pop.
 - Press the exit key to finish V-COM adjustment.

